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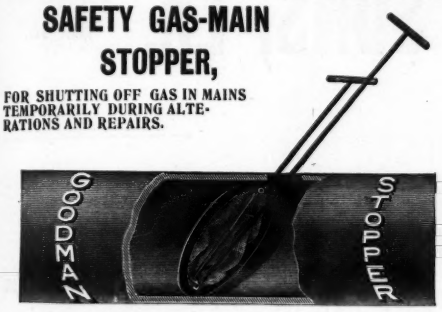

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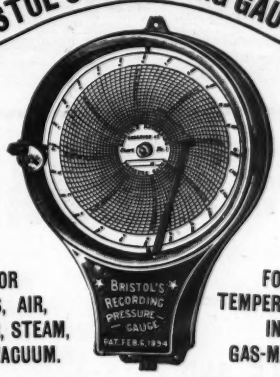

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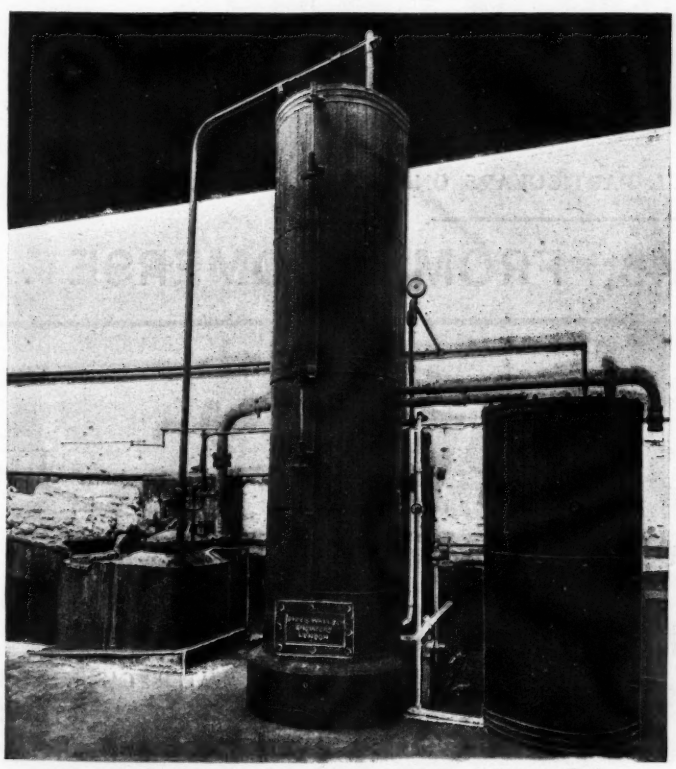

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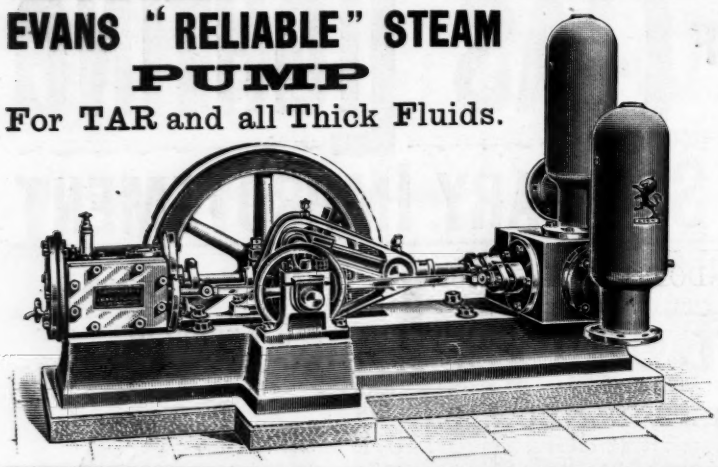

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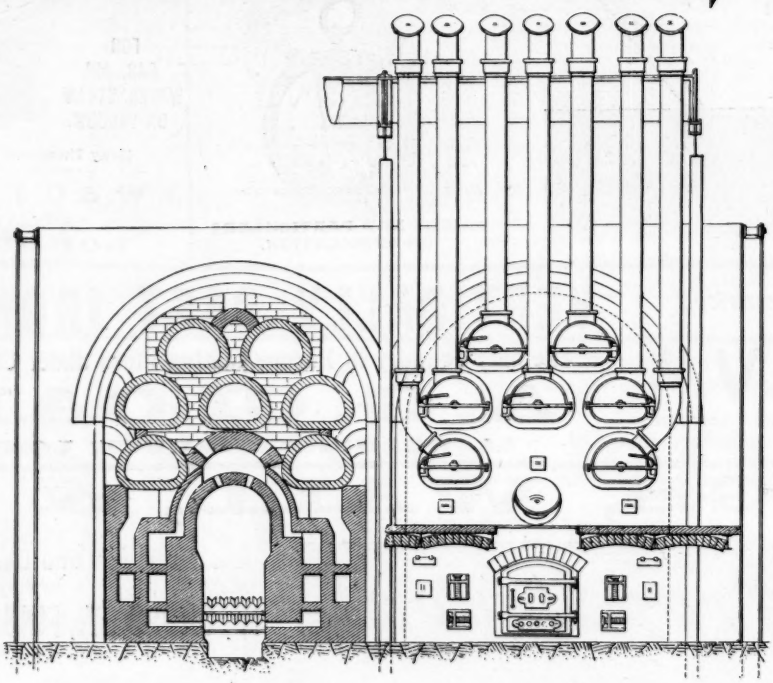

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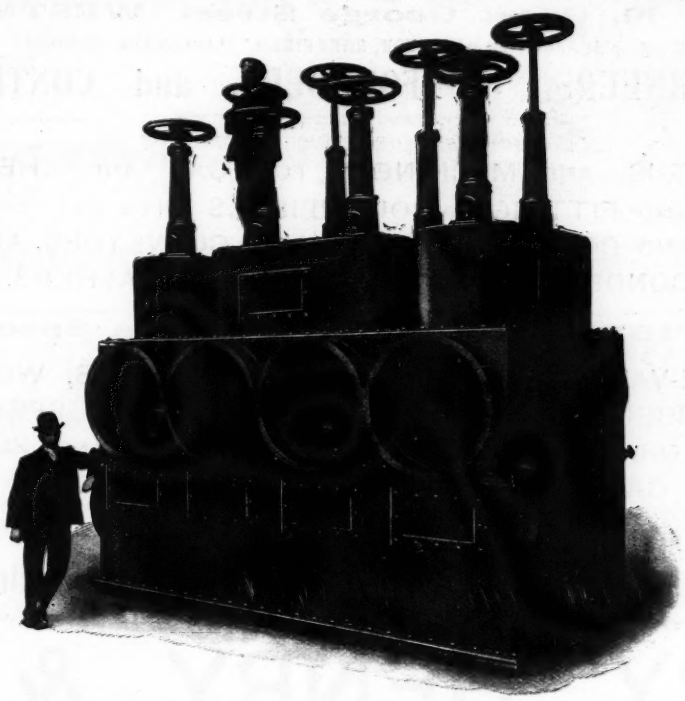

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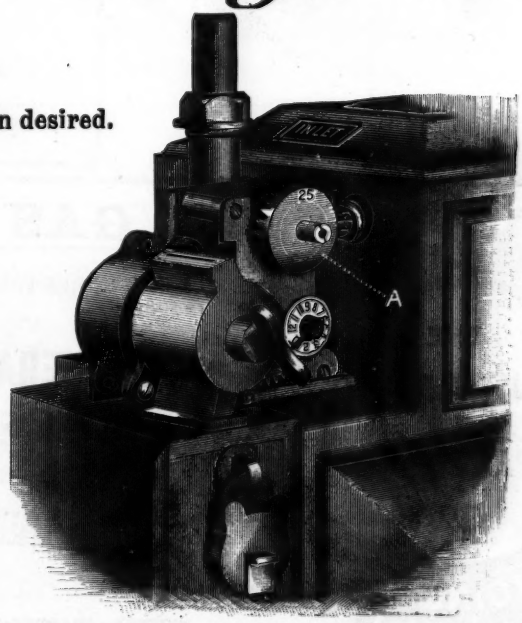

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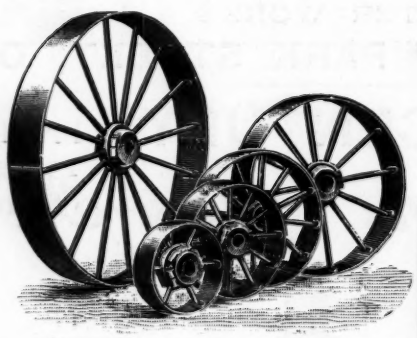

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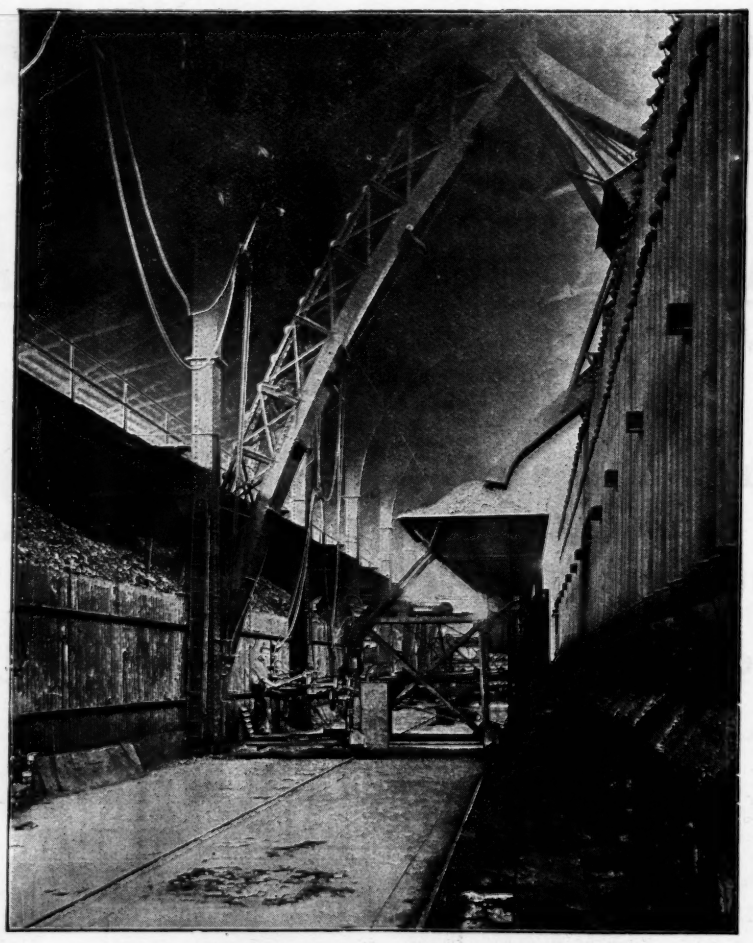

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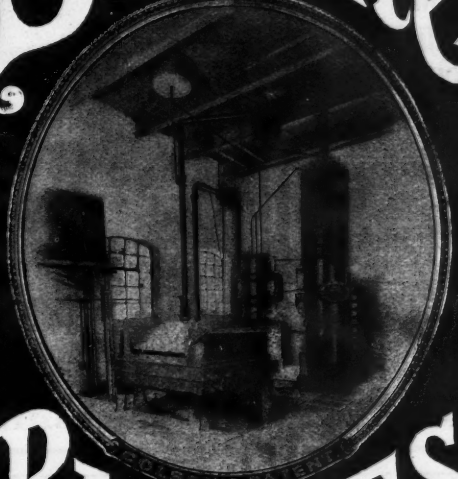

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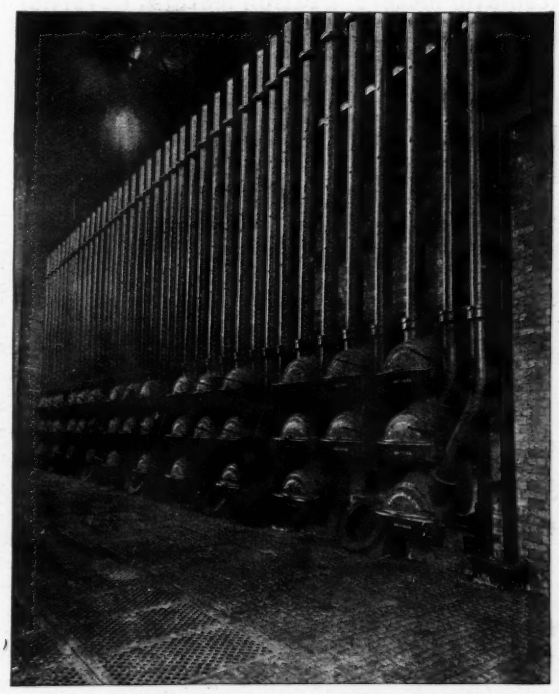

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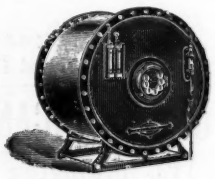

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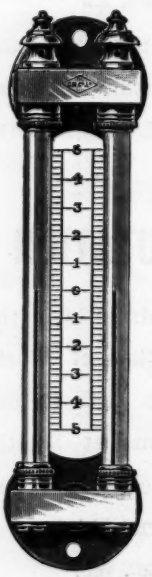

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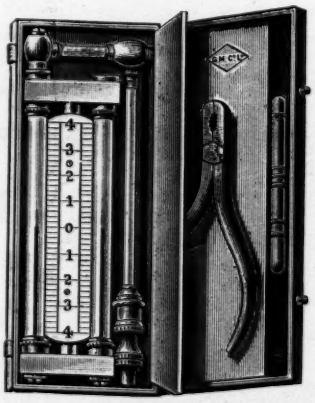

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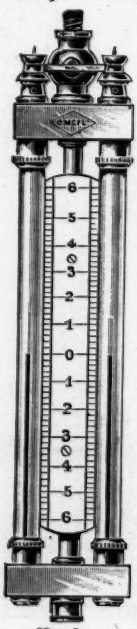

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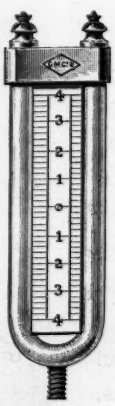

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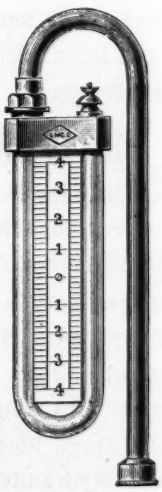

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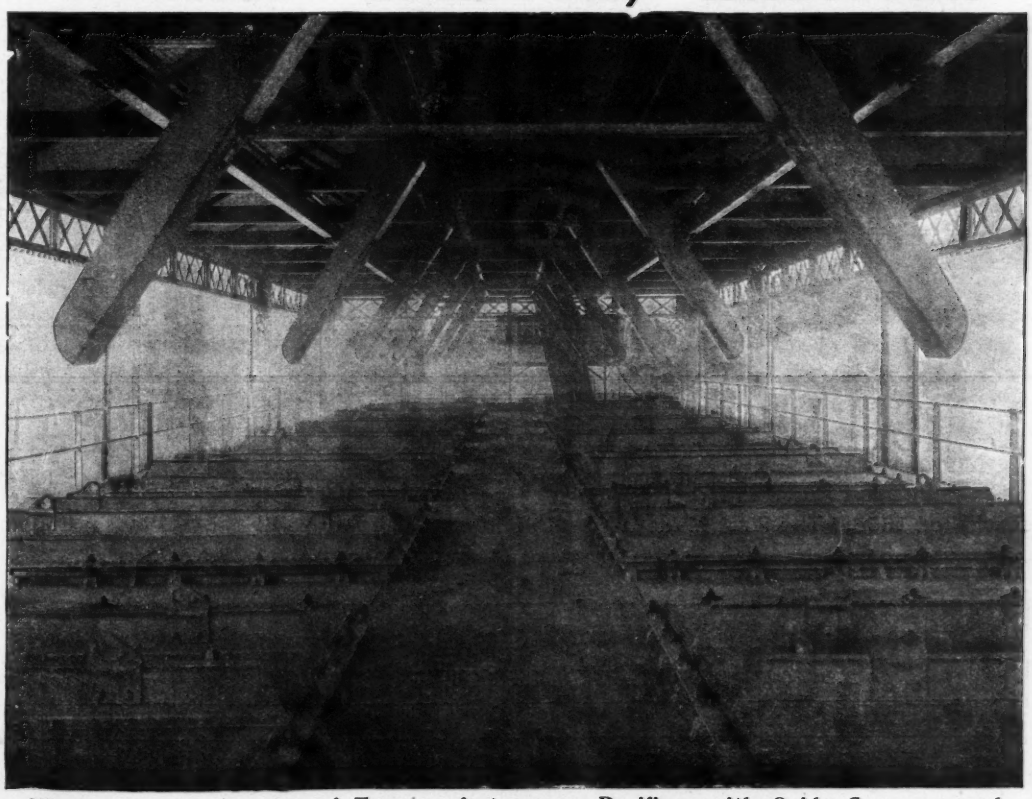

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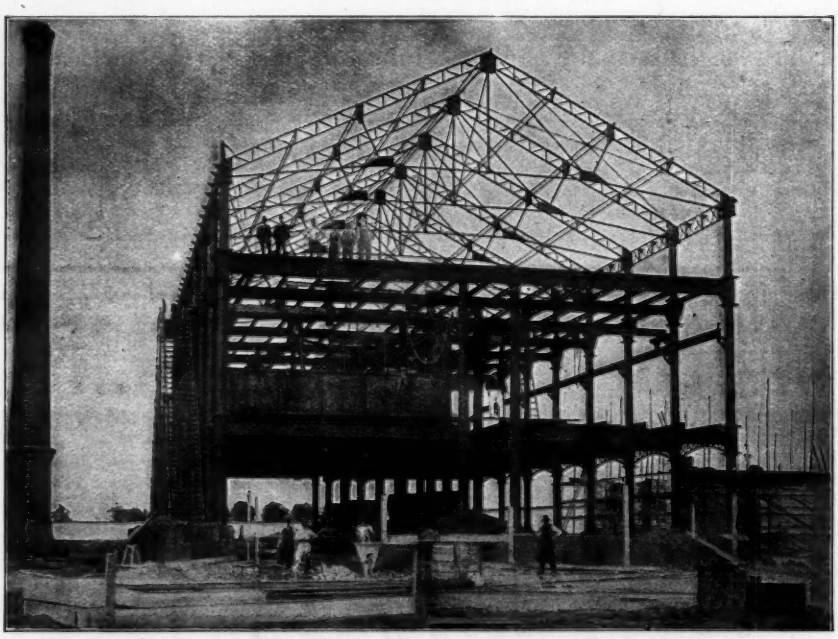

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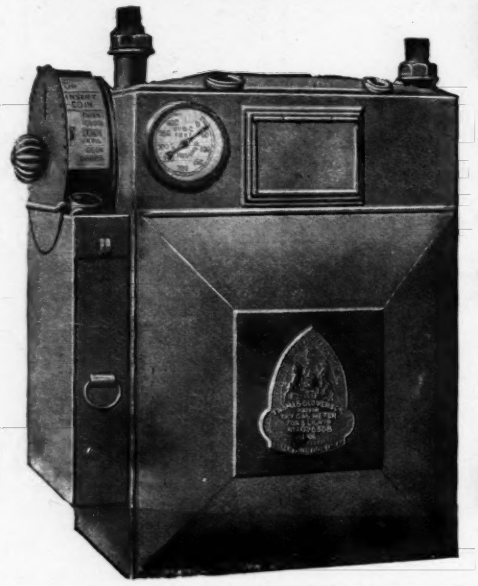

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EDITORIAL NOTES—GAS, &c.

Reduction of Candle Power at Glasgow.

A FURTHER step in the direction of supplying low-grade and "cheap" gas has just been taken by the Corporation of Glasgow. By their Act of 1869, the standard of illuminating power was fixed at 25 candles. Acting under the advice of the late Mr. William Foulis, parliamentary sanction was applied for and obtained in 1882 to reduce this standard to 20 candles, which thenceforward became the illuminating power of the gas supplied. This large reduction, be it observed, took place long before the movement in favour of low-grade gas had commenced elsewhere, and during a period when local authorities almost everywhere were availing themselves of every opportunity for obtaining from gas companies some increase of illuminating power. But the change proved to be so eminently satisfactory that, when again before Parliament in 1901, and acting on the same advice, power was sought for and obtained to reduce the standard by another four candles—namely, to 16 candles. It is interesting to note that the change made in 1882 was recommended by the Engineer principally on the ground that it would render available for the purposes of the undertaking a large supply of cheap coal which was entirely shut out by the high minimum standard of illuminating power of 25 candles. Mr. Foulis foresaw, also, even at that early date, that "a cheap gas would tend to develop and encour- "age many industries, and would greatly increase the rate "at which gas is being introduced for purposes of trade and "domestic use." These reasons were further emphasized in 1901—by which time the use of gas for cooking, heating, and motive-power purposes had greatly developed; while incandescent gas lighting had largely superseded the old flat-flame system of burners—the conclusion arrived at being not only that "there is no advantage to be gained by "using a high quality of gas," but also that "a lower "quality would be more profitable to the consumers."

The power then obtained was not, for various reasons, immediately acted upon; and it can be easily understood that the lamentable death of Mr. Foulis, and the construction of the gigantic new works at Provan, have given the Gas Committee, during the last two or three years, quite enough to think about. In our editorial notice, however, of Sept. 20 last of the formal opening of the Provan works, it was observed that the early abandonment of enrichment appeared to be foreshadowed by the building which contains the plant for this purpose being of a temporary character, the reason for which, as explained in the description of the works, was that the Corporation might, in the near future, take advantage of their existing statutory authority to reduce the present high standard quality of the gas supply, and supply the same at a lower illuminating power. That which was then so clearly foreshowed has now actually come to pass. Mr. Alexander Wilson, the present Engineer-in-Chief to the Corporation Gas Committee, has been able to report that all the reasons which had formerly been given by his predecessor for the reduction of the standard of illuminating power are of weight in the present circumstances; and he furnishes, in support of his recommendation that the power obtained in 1901 should now be exercised, some very interesting particulars (which are quoted elsewhere in our columns) of the number of heating appliances, gas-engines, and incandescent burners in use last year within the Corporation area of supply. Mr. Wilson gives in his report some further, and practically unanswerable, reasons in favour of the change to 16 candles—not the least important of which is the fact that, excluding Glasgow, of the total gas made by undertakings each producing over 1000 million cubic feet per annum, only 6·7 per cent. is of 20-candle power or more; while 73·5 per cent. is under 17 candles.

The recommendation of Mr. Wilson, having been adopted by the Special Sub-Committee appointed to consider the subject, was brought before the Town Council at their meeting last Thursday, and approved by an overwhelming majority. It is intended to reduce the illuminating power from June 1 next to 18 candles, and afterwards, when it is deemed advisable by the Gas Committee, to 16 candles. One speaker at the Council meeting described the proposal as the most practical that had ever been brought before them; and the opinion was generally expressed that the saving in cost of manufacture which is likely to result will be greatly to the advantage of consumers, and encourage the use of gas for all purposes. For our part, we heartily congratulate Mr. Wilson upon the practically unanimous acceptance by the Council of a proposal from which both the undertaking and the consumers are likely to reap substantial benefit. In this no less than in other matters, Glasgow sets an example of enlightenment and progress that might with advantage be followed elsewhere.

The Metropolitan Gas Companies' Accounts.

ON p. 634 of the present issue of the "JOURNAL" will be found the annual tabular statement of the accounts of the Metropolitan Gas Companies for the year 1904. As pointed out when noticing those for the preceding year, the Companies, having all converted and consolidated their capitals, once more stand in this respect upon a common basis. The total capital engaged in the supply of gas in London at the close of last year amounted to £38,148,301; being £167,784 more than at the corresponding period of 1903. Of this sum, £100,000 was raised by the South Metropolitan Company, and the remainder by the Commercial Company. The income derived from this invested capital amounted to £6,314,019, and £4,652,306 was expended in earning it; leaving a gross profit of £1,661,713—being at the rate of £4 7s. 2d. per cent. on the capital, and £36 per cent. on the gas-rental. The former figures show that the London Gas Companies do not earn the "bloated dividends" which municipalizers were at one time only too ready to charge them with making. Turning to the table showing the various items of revenue and expenditure worked out on the basis of the quantity of raw material employed, it will be seen that the capital per ton comes out at £11 1s. 8·22d., compared with £11 3s. 7·46d. in 1903. As in that year, the Gaslight and Coke Company are highest, the South Metropolitan lowest; while the Commercial stand just between the two. The total income from all sources last year averaged £1 16s. 8·30d., against £1 17s. 11·24d. before; the total expenditure £1 7s. 0·42d., against £1 7s. 8·04d.—showing a gross profit of 9s. 7·88d., compared with 10s. 3·20d. The expenditure figures for the two years are remarkable, in view of the magnitude of the business. The raw material cost, on a average, 12s. 0·87d. per ton, and wear and tear of manufacturing and distributing plant 5s. 9·81d. per ton, compared with 12s. 7·31d. and 5s. 11·18d. per ton in 1903. The third table shows that the Commercial Company were conspicuous last year as the only one having an increase in their rental; but they shared, in association with their two neighbours, in the drop of £49,871 in the returns from residuals. There was altogether a decrease of £129,181 in the total revenue. But, on the other hand, there was a similar movement in the principal items of expenditure, totalling to £47,162; so that the gross profit is reduced to the extent of £82,019 only. There was a saving of £63,966 on raw material; £39,813 being effected by the Gaslight and Coke Company. But this Company had a considerable increase in the distribution department; and their rates and taxes were £13,543 higher than in 1903. On the other side of the water, however, the noteworthy item of decrease, apart from £20,943 saved on raw material, was £26,451 for salaries and wear and tear in connection with distribution.

The following table shows the carbonizing results of the three Companies, so far as these relate to coal gas manufacture only; and the figures may be left to speak for themselves. It should be pointed out, however, that in all cases there was a higher make of gas per ton last year than in 1903; the mean being 10,474 cubic feet compared with

10,383 cubic feet before. The production of residuals was surprisingly similar to that for the year 1903—the only variations found being in an upward direction. The table bears witness, as its predecessors have done, to the general efficiency with which the manufacturing operations of the London Gas-Works are carried on; but though the increased make of gas per ton of coal is encouraging, the fact must not be lost sight of that our columns have lately furnished evidence that the Metropolis has something to learn from the Provinces in this respect.

TABLE *showing the Residuals produced and the Gas made per Ton of Coal and Cannel by the Metropolitan Gas Companies in the Year* 1904.

Name of Company.	Coke.	Breeze.	Tar.	Am. Liq.	Gas.
	Cwt.	Bushels.	Gallons.	Gallons.	Cub. Ft.
CHARTERED	12·58	5·76	10·31	32·75	10,212
COMMERCIAL	12·25	6·10	11·65	34·57	10,689
SOUTH METROPOLITAN .	12·36	5·13	9·88	34·13	10,817
Mean per Ton . . .	12·47	5·55	10·24	33·40	10,474

Shareholders' Criticism.

AFTER the speech from the chair at gas companies' meetings, the proceedings are usually of a vapid and monotonous order. A few platitudes in the way of congratulation, and occasionally—but very occasionally—expressions of disappointment, most often constitute the accompaniment to the formal passing of resolutions. Now and then, shareholders are found who, having a penchant for figures and inquiry, delve for information among the differences in items which the intricacies of a large business like gas supply naturally produce. Rarely, however, do we find serious points raised bearing on policy or working. The reason for this is understandable. To the public (speaking, of course, generally), the gas-meter marks the point from which all is a mystery concerning gas manufacture, distribution, and management. Gas is something that cannot be seen or felt; and therefore, because there is nothing tangible about it (like coal or most other household requirements), the layman knows little about it, and takes little interest in it other than its uses. Therefore, the industry of gas supply being of quite a specialized character, it is not a frequent occurrence that a shareholder is found who is really qualified, by practice or experience, to criticize fairly and usefully points of working and administration. But now and again we do find gas engineers and managers attending the meetings of companies in their capacity of shareholders and making pertinent comment on points of policy or of figures, or calling attention to matters which their training has enabled them to fix upon as of special interest. It is always a relief to hear them; but their interposition in the proceedings is only welcomed or otherwise by the gentlemen facing the shareholders in precise ratio to the eulogy or the stricture. When the criticism happens to be of the latter order, there are some Gas Company managements who feign pious surprise that professional men should indulge in calling to account the working of a colleague or the administration of his Board. Such conduct is marked down as want of good taste. But those managements who do not approve of, or like, such criticism may well be asked, Who is more capable, and who, being capable and a shareholder, has more right, than a professional gas man, of criticizing at a meeting the working of a gas concern? Many of those good men who object are, without the aid of their own engineer and manager, just the ones who are incapable of making reply to such critics; and there are instances where even the engineer himself, unaided, or without some previous preparation, cannot find it within himself to reply to the critic with the cogency necessary to destroy his case. There is an argument here in favour of the inclusion of an expert gas director on every Gas Board. Two heads are sometimes better than one—and more especially when it is a question of immediate defence.

Criticism of the kind to which we have been referring is interesting; and it occasionally gives birth to ideas that have their influence on future working. It may also produce the utterance of words which raise a matter for consideration. The meeting of the West Ham Gas Company last Tuesday was distinguished for yielding such a point. And that point was, in short, What are and what are not proper subjects for shareholders to discuss at their meetings? It is difficult to draw a dividing line; but a general answer would be that shareholders are entitled to comment upon, or criticize, any matters appertaining to the affairs of the Company the public discussion of which is not detrimental to the interests of the concern. With the reservation already mentioned, such subjects include the questioning, by shareholders whose special knowledge qualifies them to do so, of the policy of the Board in any particular direction. We have the greatest respect for the Engineer and General Manager of the West Ham Gas Company (Mr. John Clark), and his important work for that Company during recent years has our admiration; but we are compelled to join issue with him on his ruling, if we may so call it, in respect of this matter of questions of policy being suitable for discussion by a gas-engineer shareholder at a gas company's meeting. Mr. J. H. Brown, the Gas Engineer to the Nottingham Corporation, was at the meeting as a proprietor, and discussed—the attention that was given to him showed that he considerably interested the proprietors in—the policy of the Board in adopting carburetted water-gas plant after they had secured from Parliament power to supply 14-candle power gas. Mr. Brown fails to find any reciprocal relation between these two events; and he opines that the plant was adopted solely on account of the weight of the "collateral advantages." What are these collateral advantages? asks Mr. Brown, the shareholder. But before he puts the question at this meeting of shareholders, he has been making search for those advantages himself, and has been unsuccessful in finding them all, except perhaps the one of the usefulness of the plant in temporary emergency.

Therefore he seeks, as a shareholder, to be enlightened. In his search, he has compared all the items of the West Ham Gas Company's accounts with the similar ones of the South Metropolitan Gas Company which are supposed to be influenced by the "collateral advantages;" and he comes out of the examination sorely perplexed. Recognizing that the West Ham Company are not the equal of the South Metropolitan in size, but have a district of something like the same composition and situation, he submits that the total of the advantages which the South Metropolitan Company—supplying coal gas only—have on those items which should reflect the "collateral advantages" of the carburetted water gas plant in the West Ham accounts is represented by 6·2d. per 1000 feet; whereas promise and expectation should have seen a large part of that 6·2d. in the West Ham Company's accounts, to the disadvantage of the large transpontine Company. The most important of the "collateral advan-"tages" claimed is the better price that the withdrawal from the market of the coke used by water-gas plant produces. On this point, another shareholder at the meeting trotted out the well-worn assertion that the South Metropolitan Company participate, without contributing to it, in the improvement in price that this occasions; but apparently the West Ham Company do not. For the former Company obtained more for coke by 2·46d. per 1000 cubic feet of gas sold than the latter. There is a little topsy-turvyism here. And it is certainly a reproach on the carburetted water-gas plant of the West Ham Company that, although the South Metropolitan Company have a larger quantity of coke to dispose of, they should have behaved so badly to their patrons in not having secured for them a greater price than was realized by the Company without the mechanical aid to the improvement of coke prices. If the "collateral advantages" are not to be found in the accounts of the Company, then where are they to be looked for?

This is a matter in which gas shareholders are interested. It is a question of administrative policy, and of fact against supposition. If there is (let us assume) a weakness of any kind in the administrative policy, is it likely that a Board, if they recognize it, will disclose it to the shareholders? If there is not a shareholder qualified to make an inquiry into it, no one else is likely to detect it. Mr. John Clark lays down the proposition that shareholders are only interested in their dividends, and do not care whether they are made out of coal gas or water gas. He should have qualified the word shareholders by the word "some;" and then agreement could have been expressed. There are many shareholders—the hearing which the West Ham proprietors gave Mr. Brown proved it—who are always glad to learn "both sides of "the question," and then bring to bear upon it their own judgment. On this occasion, however, and this is the only weak part in the proceedings at the West Ham meeting,

the proprietors were left without any kind of answer to assist them in forming their own conclusions on this particular point in the policy of their Board. Is it sufficient to say that the Board are doing their best, when a proprietor asserts—the assertion being supported by figures—that another Company are doing better in another way? The matter raised by Mr. Brown was a question of policy; and we cannot come to any other determination than that it was a very proper one for a proprietor to introduce. The proprietors, we have no doubt, would like to know the causes operating to produce the differences referred to by Mr. Brown between the two Companies' accounts. It must not be forgotten that Directors are proprietors elected by their fellows, and paid for their services out of the revenues of the Company, to look after the interests of the whole of the proprietary; and it is therefore quite within the right of a proprietor to animadvert on any point in his representatives' policy, which will not, through publication, tend to injure the interests of the Company. Mr. Clark suggests that the particular point on which comment has been made is more suitable for a Gas Manager's Association meeting than that of a Gas Company's. But the unfortunate thing is that the opportunity that Mr. Brown will have of meeting Mr. Clark at a gas managers' meeting for the discussion of this subject is very remote, seeing that, to the best of our knowledge, the latter gentleman is not a member of a single organization of the kind in the country. The hint was thrown out that the two should meet together in a friendly way, and thresh the matter out. If they do this, the Technical Press would be willing auditors.

We cannot close this necessarily lengthy consideration of a matter of interest to most gas shareholders, without saying that the business of the past half year and year of the Company shows a continuance of notable development, and that the manufacturing operations present some excellent figures. One point which it might be worth while engineers enquiring into is the make of "12,851 cubic feet "of gas per ton of coal and oil." There are not a few of Mr. Clark's neighbours who have yet something to learn from him—whether it would pay them to adopt his methods is another matter.

A Lesson from the Board of Trade Returns.

THE favourite topic of municipal extravagance formed one of the subjects on which Mr. W. G. Bradshaw discoursed to the shareholders at the recent half-yearly meeting of the Commercial Gas Company, of which he is Chairman, and to it we may give a little further consideration. He told the meeting, as exemplifying the increasing burden which is imposed on industry in the shape of rates, that, in the case of this Company, the amount paid for rates had risen from £4742 in 1876 to £18,403 in 1904, or 288 per cent., although the capital expenditure during the same period had only increased from £566,157 to £1,298,941, or 129 per cent. These figures are startling; but, it is seen, when examined a little more closely, that they appeal to the imagination rather than convey, as figures authoritatively given should do, a correct idea of the position. Many would be led to infer from them that the rates had gone up more than 100 per cent. during the period referred to, which does not appear to be the case. No mention was made of the proportion which the profits bear to capital—this, apparently, having considerably increased since 1876. Stated, however, in terms which are intelligible to every one—namely, at per 1000 cubic feet of gas sold—the increase has been about 50 per cent., or, roughly ½d. per 1000 cubic feet; the amount for 1903, according to Field's Analysis, being 1·59d. per 1000 cubic feet sold, which compares with 1·57d. in the case of the South Metropolitan Company. Of course, a 50 per cent. increase is not to be belitted; and we cannot but fully agree that every legitimate effort should be made to check the growth of this expenditure.

Mr. Bradshaw spoke, apparently, more as a banker than as Chairman of a Gas Company when declaiming against the practice which has been introduced by some local authorities of inviting deposits or loans of small amounts. He could hardly, however, have been serious in suggesting that this practice (considered alone) must have a disastrous effect upon the industries of the country, because if the money be not raised in one way it will be in another—subject always to the control of the Local Government Board. All will agree that the offer of any extravagant rate of interest by local authorities should not be permitted; but, of course, there is a difference between this and giving a somewhat higher rate than banks can afford to allow, seeing that local authorities are in a better position than the latter, not only for the reason given by Mr. Bradshaw, but also because they have no heavy establishment charges to meet, and no shareholders keen for a 15 or 20 per cent. dividend. In our opinion, however, little alarm need be felt by bankers with regard to the system of deposits; for this is not likely to spread to any extent, the trouble of it being found to be more than it is worth. The encouragement of small loans is another matter; and this really can be productive of no greater amount of harm—or rather of no less good—than the issue of gas stock to consumers, instead of through brokers in the open market. Both schemes have much the same object in view—namely, that of enlisting local sympathy. If it be desirable—as it undoubtedly is—for consumers of gas to be shareholders in the company supplying them, it is surely also desirable that ratepayers (and even the working man to whom Mr. Bradshaw appeals) should have the opportunity of lending the money which is to be expended by their representatives. Just as the French Rentes are said to be a popular investment with the French peasant proprietors, so ought municipal loans to be popular as investments among the members of the communities by whom they are incurred. The more that money can be raised in the locality in which it is to be expended, the greater will be the vigilance exercised over its expenditure.

Mr. Bradshaw spoke in a tone of alarm of the heavy indebtedness of the local authorities, but said nothing about their assets in the shape of gas, water, or other works. In this respect they have the advantage of the Imperial Government, although it is true that the National security is an asset which cannot be too highly valued. We hold very strong opinions as to the undesirability of entrusting local authorities with the conduct of trading undertakings, especially when this brings them into competition with private enterprise; but it is not possible to shut one's eyes to facts. Taking the gas supply, in which we are chiefly concerned, as an illustration, can it be said that this has been "reck-"lessly administered by local authorities?" The Board of Trade Returns recently issued, and on which we commented a fortnight ago, do not support such an accusation. They show that in the year 1882, which was the first year that these returns were made, there were 148 gas undertakings owned by local authorities, with an aggregate sale of 21,129 million cubic feet, and a total capital of £17,326,183, or £820 per million cubic feet sold, of which £2,283,005, or 13·2 per cent., had been repaid by sinking funds or other means. In 1903-4, the number of such undertakings had increased to 260, with an aggregate sale of 57,754 millions and a total capital of £37,103,279, or £642 per million cubic feet sold, of which £9,426,484, or 25·4 per cent., had been repaid. Thus in the 21 years not only has the total indebtedness of the undertakings been further reduced by 12·2 per cent., but the capital expenditure per million cubic feet sold has also been reduced by £178, or 20 per cent. The significance of these figures becomes increasingly apparent when they are compared with the corresponding figures as to undertakings owned by private companies. The return relating to these shows that whereas in 1882 there were 352 statutory undertakings having an aggregate rate of 45,485 million cubic feet, and a total capital of £32,934,935, or £724 per million cubic feet sold, in 1903 the number of such undertakings had increased to 459, with an aggregate consumption of 93,923 millions, and a total capital of £80,869,179, or £861 per million cubic feet sold—thus showing an increase on the latter of £127 or 16 per cent. This increase is no doubt due to a great extent to conversions of stock; but, on the other hand, it must be recollected that gas purchases by local authorities have usually taken place at much higher rates than (say) £1000 per million cubic feet sold. It is quite evident, therefore, that whatever may be the shortcomings of local authorities in other respects, they are, as regards their gas undertakings, pursuing the prudent policy of keeping down capital outlay to a much greater extent than are the gas companies. Whether this is being done to a greater extent than is just to the present consumers of gas is another matter, and one into which it is not possible at the present time to enter. As regards carbonizing results, a comparison of the two periods shows that in the case of the local authorities there has been an

increase in the quantity of gas made per ton of coal carbonized from 9873 cubic feet in 1882 to 10,200 cubic feet in 1903-4, or 327 cubic feet per ton. In that of companies, the increase has been from 10,006 cubic feet in 1882 to 10,369 cubic feet in 1903-4, or 363 cubic feet. By companies the unaccounted-for gas has been reduced during the same period from 7·85 to 7·45 per cent., and by local authorities from 9·2 to 7·90 per cent. These are results which cannot but be regarded as creditable to all concerned in the management of the undertakings.

The Gas Question in Paris.

THE situation created by the refusal of the French Senate to agree to the scheme submitted by the Chamber of Deputies, with the support of the Government, for the control of the gas supply of Paris as from the commencement of next year, to which reference was made in these columns last week, caused some uneasiness among the parties principally concerned; and, in view of the limited time remaining before the expiration of the Gas Company's concession, it was decided to have a conference to consider the position. This was at once convened by the Gas Committee of the Municipal Council, and was held last Tuesday at the Hôtel de Ville. It was fairly representative in character—comprising six senators, thirteen deputies, and forty-three municipal councillors—and was presided over by M. Navarre, the Chairman of the Committee. After about an hour's discussion, a resolution proposed by M. Sauton, who has all along figured very conspicuously in connection with the various inquiries into the subject of the supply of gas in Paris, was carried unanimously, expressing the opinion that, as the effect of the action of the Senate was to maintain the existing monopoly, an appeal should be made to the public authorities in order that the decision come to by the Municipal Council in December, 1903, in favour of direct control of the gas supply might be carried out. The resolution was duly forwarded to the Government. This conference was followed on Thursday by a meeting of the opponents of the system condemned by the Senate. M. Paul Escudier presided; and the outcome of a long discussion was the passing, by a unanimous vote, of a resolution pointing out that any further delay in the settlement of this question will only aggravate the present difficulties, and calling upon the Chamber of Deputies to give legislative effect to the wishes so frequently expressed by the Chambers of Commerce and Industry in the name of the parties chiefly interested.

At this meeting, emphasis was duly laid, and not without reason, on the great delay which has already occurred in bringing this business to a conclusion. As we remarked, a few weeks ago, Paris is within ten months of the expiration of the contract under which the city is supplied with gas, and no definite arrangement has been made to continue the service. On the 31st of December, the Municipality will be entitled to half the Gas Company's assets; and yet, so far as we can learn, they have not made the slightest attempt to ascertain their value. The Company, on the other hand, are busily engaged in preparing for their winding-up; and the result of their labours will probably be made known at the annual meeting a few weeks hence. The Directors would, doubtless, be prepared to render assistance in arriving at a solution of the existing problem; but it is for the Chamber or the Municipal Council to ask for it. At the opening of the new session of the Council, M. Ambroise Rendu will move a resolution for the adoption of a system of interested control, under which the works and plant passing into the hands of the City will be let to the highest bidder, either at a price per cubic metre of gas made or sold, or on a sliding-scale rising or falling with the dividend declared by the concessionary company. There is consequently a prospect in the near future of some more lively discussions on this subject. Meanwhile, the Ministerial Council have decided to send back to the Chamber the Bill amended by the Senate, with a request that the modifications introduced therein may be rejected, and the original proposal for direct control, adopted both by the Municipal Council and the Chamber, restored. At the same time they will ask for the insertion in the remodelled Bill of a clause specifically fixing at 20 c. per cubic metre—equal to 4s. 6d. per 1000 cubic feet—the maximum price to be charged for gas. It would seem, therefore, that the "old order" of 30 c., under which the Parisians suffered—and, we may venture to add, the municipal exchequer benefited—for so many years, has gone for ever.

The Birmingham Medal for Mr. James W. Helps.

It is an "open secret" that the Council of the Institution of Gas Engineers have unanimously and warmly endorsed the view of Mr. H. E. Jones that the time is peculiarly favourable for commemorating the distinguished work of Mr. J. W. Helps both for the gas profession's organizations and for the gas industry generally. His signal services in connection with the question of amalgamation, affiliation, and the International Gas Exhibition have brought strikingly into the light those singular personal qualities which have enabled him to accomplish so much that has been successful. The nature of the work upon which he has brought his gifts to bear is not such that it carries in its train those rewards which (say) inventive talent successfully applied merits and often receives; but service such as he has rendered should any way be honoured by some form of recognition. The Council have therefore decided to confer upon Mr. Helps the Birmingham Medal; and it can well be imagined that when the President, Mr. D. Irving, rises, at the annual meeting of the members of the Institution in June, to perform the duty, which many may covet, of handing the gas profession's symbol of distinction to the latest of those considered worthy of the honour, the event will be the one of the meeting around which will hang the greatest enthusiasm. The Council, having come to this determination, are taking the necessary steps to comply with the third of the regulations applying to the Birmingham Medal, which regulation is shortly that the Council shall, not less than one calendar month prior to the meeting at which the award is to be made, issue a circular notice to that effect to the members, setting forth the object of the medal, giving the names of persons who have already received it, and inviting members to send in the names of such persons as they may think fit for the consideration of the Council. Previous recipients of the Medal are: Sir George Livesey (1882), Frederick Siemens (1884), Charles Hunt (1886), Thomas Newbigging (1890), Wm. Henry Perkin (1892), Wm. A. Valon (1894), Baron von Welsbach (1897). The fact that eight years have passed since the distinction was conferred, adds lustre to the new award.

Meddlesomeness or Spitefulness?

The latest move of the London County Council has about it the appearance of spitefulness or meddlesomeness—perhaps both. Penge is a suburban district, self-governing, and within the County of Kent, with no connection whatever with the London County Council, beyond being in their debt for the time being until financial matters are adjusted between them in respect of the severance which took place a few years ago when the local government of London was rearranged. Penge, however, is in the district of the South Suburban Gas Company; and the attitude of the District Council towards the Company in connection with their recent policy and the Bill in Parliament has been one which could almost be described as "passive resistance." They have petitioned against the Bill; but otherwise their interest in the matter has been of an incurious order. This apparently is not satisfactory from the point of view of the London County Council; and, notwithstanding that they have no business with the affairs of Penge, they have sought to infuse into the District Council a little more activity by forwarding to them, on the 22nd ult., the following letter, to which the signature of Mr. G. L. Gomme, the Clerk, is appended:—

> I have been directed to forward, for the information of the Urban District Council of Penge, the under-mentioned particulars of tests made, with the portable photometer, of gas supplied by the South Suburban Gas Company, during the two weeks ending the 11th February, 1905. The standard illuminating power of gas supplied by the South Suburban Gas Company should be 15 candles. The highest result—viz., 12·43 candles—was obtained on 8th February, 1905, at the Council's School, Salter's Hill, Gipsy Hill, and the lowest—viz., 12·01 candles—at the Council's School, at Woodland Road, Gipsy Hill—the average being 12·22 candles. These results were obtained when the gas was being burnt in the manner described in the South Metropolitan Gas Act, 1900. If the tests had been made when the gas was being burnt at the rate of 5 cubic feet per hour in the same burner, the average would have been about 10·5 candles.

We can imagine the good and wise men of the Penge District Council scratching their heads over this letter in the vain effort to interpret its import. Those members with the greatest knowledge of measurement wield the yard stick and the birch. But

the portable photometer is an instrument that has never come across their guileless paths; and "candle power" is a quantity which doubtless they associate with the guttering companion of bedtime in their youthful days. The Council did the easiest thing possible with the County Council's communication by referring it to the Lighting Committee, to see whether they could make anything of it. The greatest point of interest about the letter, however, is (quite apart from the question of the unreliability of tests made by the portable photometer under conditions unauthorized and unrecognized by Parliament or the Gas Referees) that it shows the length to which the County Council will go in instigating antagonism to the Gas Companies.

A Gas Association for Wales and Monmouthshire.

An "icy isolation" appears to fairly describe the position which the gas engineers and managers of Wales have felt that they have been occupying both in relation to existing District Gas Associations and to each other; and they have come to the conclusion that they are now quite strong enough to walk alone. Geographically, they are ill-placed so far as any other organization is concerned; and so, without great inconvenience and loss of time, they have been debarred from participation in the technical work, personal conferences, and fellowship which are enjoyed by their *confrères* in other parts of the country. The idea of a District Association for the Principality is not by any means a new one; but it has never before got much farther than the desire on the part of the few—it having been considered that there was not in Wales sufficient material available for keeping together an independent organization. After the highly successful meeting convened by Mr. Octavius Thomas at Cardiff last Wednesday (on the proposition of Mr. John M. Small, of Merthyr Vale), together with the promises of support by some forty gas engineers and managers, the old reason for the non-existence of a Welsh Association must be held to no longer stand good. The matter, in fact, has now been taken up with a warmth which augurs well for the future of the "Wales and Monmouthshire District Institution of Gas Engineers and Managers." The title itself, we fear, will be almost as difficult to remember and to roll off the tongue as many of the names which give such distinction to the map of that section of the country. The first business that could be profitably taken in hand by the new organization would be the curtailing of their title. With such active and experienced Institution men as Mr. Thomas Canning filling the office of President and Mr. Octavius Thomas that of Hon. Secretary, the Association will receive a good start. Wales has not been behind the times in the application of modern methods to retort-house work; and from the Welsh Association, we expect, and have no doubt, that much of interest will issue. The Association have our best wishes for a successful career.

Companies and the Municipal Franchise Bill.

The further attempt to remove the injustice which trading and mercantile companies suffer in respect of a voice in local affairs has, upon the introduction of the Municipal Franchise (Companies) Bill for second reading, failed. Sir Albert Rollit fathered the measure; and, when he brought it forward last Friday in the House of Commons, he very properly urged that where there was taxation, there should also be equal representation. Therefore his proposal was that companies who, though contributing so largely to the rates, are disenfranchised under the existing law, should be allowed to exercise a vote by a responsible officer. Sir Albert seems to have been disturbed more by the noisy verbosity of a factious opposition than by any real expression of the general opinion of the House; and he retreated with the Bill in something which looks suspiciously like panic, after requesting and obtaining permission to withdraw his protégé. The rights and wrongs of such concerns as gas companies in regard to this question are so well known to readers that they need no recapitulation here; but in view of the loss of this hope of redress of the long-standing grievance, gas companies must continue to maintain a sharp look-out on parliamentary measures of municipal origin, which have for their purpose the conferring of powers which would be detrimental to the interests of private enterprise. The Electricity Supply Bill, if again introduced, is one of those which should be carefully watched. There is a ray of sunshine in the fact that the new Chairman of Committees of the Upper House (Lord Onslow) ranked himself, only a short time since, on the side of those who seek to repair the injustice referred to, and made a strong appeal in the matter. We do not marvel that those who profess and call themselves Progressives should regard his Lordship's appointment with bitter disfavour.

Provincial Gas Companies' Results.

As is usual at this time of the year, there have during the past few weeks been taking place all over the country those gatherings at which the administrators of gas companies are wont to render an account of their stewardship; and, following our usual practice, we have noticed such of the meetings as have presented some features of general interest. The companies that have come within this category are fairly typical of the whole number; and the information to be gleaned from their proceedings may be briefly summed up in two words—"Continued progress." Everywhere—or, at any rate, nearly everywhere—the consumption of gas goes on increasing in a manner that is as cheering to those who have the welfare of the industry at heart, as it must be disconcerting to the numerous "false prophets" who have for some years past been foreseeing its early decay. It may be that the increases are not always so large as has been the case in past times; but there are reasons to account for this which do not in any way affect the soundness of the business. For one thing, there is the growing use of the incandescent system; and for another, there is the fact that the country has suffered from trade depression during the past twelve months. Now, however, everything points to an improved state of affairs in the latter respect; while any influence on consumption that may be temporarily caused by the introduction of incandescent burners will no doubt right itself in time. Along with the increase in the output of gas, there has been a very general decrease in the returns from residuals; but this, of course, is an item which must be liable to alteration from year to year, and movements cannot be expected to be always in an upward direction. The prices receivable for their bye-products, too, are—at any rate to a very large extent indeed—beyond the control of the gas companies, and must be governed by the prevailing market conditions for the time being. Looking fairly at the question, it may safely be asserted that no sounder industry exists at the present day than that of gas supply; and shareholders may be heartily congratulated on the prospect which reveals itself of a never-ending series of maximum dividends, as well as consumers on the promise of a still further cheapening of the already cheap means of lighting, heating, and production of power which is at their command.

The Public Lighting of Canterbury.

Apparently the Lighting Committee of the Canterbury Town Council have not found it so easy as might have been supposed would be the case to come to a decision regarding the offer of the Gas Company (made when the Corporation were contemplating an extension of the public electric lighting) to convert the whole of the street-lamps that are lighted by gas to the incandescent system, without extra charge to the Council. At all events, the Chairman stated at the recent meeting of the Company that no response to the offer had then been received. In view, however, of the general consensus of opinion that the lighting as at present carried out by the Corporation themselves—by means of incandescent electric lamps—is extremely unsatisfactory, it should not be too much to hope that in good time not only will the existing gas-lamps be fitted up so as to conform with modern ideas of good street lighting, but that the electric glow lamps will be removed in order to make way for the better and cheaper system of illumination which the Gas Company have to offer. If any further evidence than that of their own eyes is needed to enable the members of the Lighting Committee to come to a decision on the matter, a careful consideration of the cost should furnish it. An increase in the charge on the rates for public lighting from £1584 by gas to £2588 for electric lights which are nearly all placed in the area formerly lighted by gas, is a serious enough matter to call for some change, even though it should adversely affect the turnover of the Corporation's "own shop." But if all this is not enough, the Committee should be still further materially assisted in their deliberations by the delightfully candid remarks of the local Press on the subject. The "Kentish Observer," after stating that the substitution of the electric light for

gas as a street illuminant, so far as Canterbury is concerned, is thoroughly disappointing (though the cost is about twice as much), ventures the opinion that the citizens have not much to thank the Corporation for in introducing the electric light. What therefore the Lighting Committee have to choose between is a system of illumination that has proved "thoroughly disappointing" and inordinately expensive, and one that is universally admitted to be efficient, and is withal most moderate in cost. As was pointed out by the Chairman, the Gas Company have a double interest in the matter, for they are not only the gas suppliers but also the largest ratepayers in the city.

The Answer from the Electrical World.

The scheme for the holding of an electrical exhibition (which it is supposed must be taken as a kind of counterblast to the Gas Exhibition from the electrical world) is taking form; and it is hoped that it will be a "big epoch-making" affair. But about this there is not a consensus of opinion. Unfortunately the Institution of Electrical Engineers, unlike our own Institution, do not appear to be taking kindly to the proposal; their view of the matter being that it is a scheme for private gain, and so they cannot see their way to give to it their patronage. The manner in which the Institution of Electrical Engineers conduct their work does not, so far as can be gathered, meet with what can be described as general approval in the electrical world; and, in this instance, they certainly seem to have taken a particularly narrow view, and to have pushed on one side a very fine opportunity for co-operation with the manufacturers. In this case, contrary to what happened in connection with the gas exhibition, the movement for the holding of an exhibition came from the manufacturers themselves through their own Association; and the members have entered into the scheme with a warmth which anyway shows they are not nonplussed by the refusal of official countenance by the representative body of electrical engineers, and that they intend to do their best. Several engineers in their individual or official capacity promise aid; and municipalities and companies have expressed themselves as favourable to an exhibition being held. Help is also expected from the Municipal Electrical Association. An important point is the question of funds. The municipalities are frightened of running foul of the Local Government Board if they contribute; but it is thought that the purchase of tickets for distribution will enable them to get over the difficulty. Still it has been decided to issue an invitation in general terms to both municipalities and companies for contributions. The estimate of the help required is £3000 in money and tickets purchased. About 70 manufacturers up to last week had promised their support; the Committee has been constituted; and the exhibition is intended to be open from Sept. 24 to Oct. 24—probably a week longer. The gas industry will keep an interested eye on the proposed show, and will extend its sympathy to the promoters over the evident lack of enterprise on the part of the representatives of those who should receive the greatest benefit from the display—that is to say, suppliers of electricity. Perhaps the Gas Exhibition will have had a stimulating effect on the latter; so that the promoters must not lose heart yet.

The Profession of Gas Engineering in America.

The manner in which it is possible to twist into words a meaning that was not in the mind of the writer is well exemplified by "Progressive Age" in calling attention to an editorial which appeared in the first issue of the "JOURNAL" this year on the subject of the Profession of Gas Engineering in America. The whole purpose of the article—its tenor conveyed it—was intended to be destructive of the dogmatic assertion of a writer signing himself "P." in the "American Gaslight Journal," that the profession of gas engineering in America was nothing more than a name. Our contemporary quotes from us: "Knowledge of the type of men who are now controlling, in an official capacity, the gas supplies of America leads us to think they are not of the same mind as 'P;' and they will not be content until they occupy a position in the van of gas-works invention, and justify, not only nominally, but *de jure*, the title of engineer." By the simple process of relieving this sentence of all that precedes and succeeds it, "Progressive Age" infers that "the 'JOURNAL' does not think that American gas engineers are so really." We can afford to forgive our contemporary this ancient journalistic dodge, seeing that our position is almost defined by taking from its article a couple of sentences: "We can point," it is said, "to much *recent* work which cannot be excelled by British or Continental Gas Association proceedings. When we talk about American gas engineering, *we speak of to-day*, and of things *recently* accomplished, rather than of a score of years ago." With all of which we are in complete accord. A man may be a trained and able engineer; but because he does not put his ability into practice, but leaves work to the contractors' designer, no one can dispute his right to the professional title. But we put it to the critic, Has not this method of doing things in the past in America tended to narrow the activity of invention in gas-works plant, just as the extensive adoption of water-gas plant had its effect in largely (we do not say entirely) diverting for years attention there from the coal-gas producing plant? Therein we find reasons for invention in gas-works apparatus and appliances not having been so prolific in America as in European countries over a course of years. We did not need for our information the statement of our contemporary that "recently" there has been greater activity in American gas engineering. The gas engineers of the United States, it is agreed by "Progressive Age," are to-day building up, by practice, in the most complete way, the full justification to their title; and that practice, we have not the slightest doubt, will give a greater breadth to gas-works invention than America has seen for some years past. Of course, in writing thus, we are speaking generally; and it must not be assumed that we assemble all the gas engineers of America in the category of those who, while managing the manufacturing and distributing operations of a gas undertaking, have not practised what we know on this side as the profession of gas engineering. Design and construction has been left much to others; and this not through any want of capacity.

Successful Naphthalene Treatment at Leicester.

We learn from Mr. Alfred Colson that the complete freedom from naphthalene deposits at Leicester, to which reference has already been made in the "JOURNAL," continues. He writes as follows: "We are only treating 50 per cent. of the gas, and are not making any water gas. I do not intend troubling you with any further figures, as naphthalene is undoubtedly dead in Leicester. The influence upon our balance-sheet for the past six months of our victory over this nuisance has been great, as you may well imagine, and shows itself in many items."

A Memorial Tablet for South Metropolitan Reservists.

The South Metropolitan Gas Company and Employees' Reservists Fund is now represented by a surplus amount of £108 14s. 11d.; and there has been a question as to how best to dispose of the amount. The Directors intend to place a memorial tablet on a space left on the wall at the foot of the stairs in the general offices at Old Kent Road; and it has therefore been decided to subscribe £68 14s. 11d. towards this purpose from the balance in hand—the remaining £40 being invested in the names of the Trustees (Mr. W. C. Beard and Mr. E. W. Gilbert), and given to the sons of (the late) Mr. and Mrs. Gooding in such amounts as are considered best suited to their requirements, on condition that they enter the Company's service on leaving school.

The Nurnberg Light.

This is an oxy-gas light invented by Herr Nürnberg, of Berlin, which is being exploited in Germany by means of somewhat flaunting advertisements. The company promoter is giving it earnest attention; and subscriptions are now being invited for the share capital of 300,000 marks (nearly £15,000) of the German Nürnberg Light Company, which is an offshoot of the Parent Syndicate, the International Nürnberg Light Company. Briefly, the light has been found—in units of about 500 and 135 candles—to give an illuminating duty of 100 hefners (87·7 English candles) for a consumption of 35 litres (1·236 cubic feet) of coal gas and the same quantity of oxygen per hour. These figures are from tests made by Herr Drehschmidt, the Chemist at the Municipal gas-works at Berlin. In the literature circulated by the promoters, they are followed by estimates of the cost of the light, based on exceedingly low prices for oxygen. Herr Drehschmidt has written in a recent number of the "Journal für Gasbeleuchtung" to disclaim any responsibility for these estimates of cost, which might be supposed, from the manner in which they have been coupled with the results of his testings, to have emanated from him. He points out that the assumed prices of oxygen are merely sanguine estimates for a very large scale of production, and cannot apply to the general use of the light. He also says there is no justification for the large capital requirements; since, if an oxy-gas light proved commercially successful, other patterns than the Nürnberg burner would at once be placed on the market.

THE GAS STOCK AND SHARE MARKET.

(For Stock and Share List, see p. 656.)

LAST week on the Stock Exchange was not so uninterruptedly rosy as the week before. It opened strong and buoyant; but afterwards it began to sway a little, according to the pressure exerted by realizations, quickly recovering as the pressure was relaxed. By Friday, however, the profit-snatching was in full swing, and this, coupled with nervous glances towards Paris, administered a full check. But things closed better on Saturday. The Money Market was steady, with a fair demand which was easily met; and the tendency in discount rates was easier. Business in the Gas Market was active and good; the volume of transactions being much in excess of any recent week's record. The demand for good class securities of late has put prices up to a point which is quite high enough as things go; and attention is now being directed to the next best class. Thus the choicest of the gas securities are in increased demand; and it may fairly be anticipated that further advances in value are in store. During the week several quotations improved to a moderate extent. In Gaslight and Coke, the ordinary was active and very firm at the figures which have ruled for the last three weeks, transactions ranging from 99¾ to 100¼. Of the secured issues, the maximum was active, and changed hands at from 92¼ to 93½. The preference was done twice at 113, and the debenture at from 90 to 91. South Metropolitan was more animated than it has been for a long time, and on the rise. On the opening day 127⅝ was marked; but before the close stock had changed hands more than once at 130. One bargain was done in the debentures at 91. Commercials were very quiet; but both issues improved a point. Business in the 4 per cent. stock was marked at 116½ and 117. In the Suburban and Provincial group, there were few changes. Alliance and Dublin new was done at 14 15/16. Bournemouths had a rise, but were not dealt in. Brentford old marked 247 and 248, and ditto new 187. Brighton original was done at 231, and the "A" at 171. A single transaction in British was at 42—the top price; and South Suburban changed hands once at 122½. On the local Exchange, Newcastle was slightly higher. Business in the Continental Companies was no more than moderate. Imperial gained a point, and was marked at figures ranging from 212½ to 215. Union was done once at 117½. European was not dealt in at all; there being no sellers. Tuscan was done at 9⅛. The undertakings in the remoter parts of the globe furnished more than their normal contributions to the transactions of the week; and one or two of them were extremely busy. Bombay fully-paid was dealt in at 6⅜ and 6⅛, and ditto part-paid at 4 15/16. In Oriental, a small amount was done "free" at 149½. Cape Town was marked once at 16 7/16. Melbourne 5 per cent. debenture was done at 103½ and 103⅜, and ditto 4½ per cent. advanced a point; but no business was marked in it. The greatest degree of activity prevailed among the Argentine undertakings. Buenos Ayres showed transactions ranging from 12¼ to 12½, and River Plate at from 12¼ to 12⅜. Primitiva was the most brisk. The ordinary was done at from 5⅜ to 6 3/16, ditto preference at from 4 13/16 to 5, and ditto debenture at 95¾ and 96.

The closing prices are shown in our Stock and Share List on page 656.

ELECTRIC LIGHTING MEMORANDA.

The Electrical Power Supply Schemes for London—Threatening the Power Business of the London Gas Companies—County Council and Municipal Agitation—A Misleading Practice—Glasgow's Debit-Balance—First Year's Experiences at Elland.

THE London Gas Companies will without doubt keep a sharp eye, in the present parliamentary session, on the several Bills which have been promoted for supplying electricity on a large scale in London, more especially the three which aspire to plant in the Metropolis works on an ambitious scale and a network of cables which threaten to make underground conditions even more mazy than they are at present. The measure with the strikingly ample title of the Administrative County of London and District Electric Power Bill, the one known as the East London and Lower Thames Electric Power Bill, and the North Metropolitan Electric Supply Bill are those which should be favoured with very strict attention on the part of the Gas Companies. An account of an interview with a gentleman interested in the promotion of the "big scheme"—that is the Company's with the preponderating number of words in its title—has appeared in the "Westminster Gazette." It is gathered from his statements that a very tough struggle is going to be made to get (in addition to serving in bulk existing electricity supply companies and authorities in London if they will bite) possession of the power service; and it is proposed to devote a goodly amount of activity to industrial East London particularly. According to this promoter, there is something altogether wrong about the present methods of electrical supply in the great Metropolis. Everybody who has hitherto had a hand in its development has laboured under a painful want of perspicacity; and they are now to be punished (of course, it is not to be expected that they will "take it lying down") for their shortsightedness. The mistake they are charged with having made is the splitting up of London into supply areas, and establishing separate works in each for the supply of electricity. Such a system is regarded as wasteful by the new school of electrical economists, and the electricity generated consequently costly. Altogether there are 100 generating stations in Greater London apart from small plants; and concentration is the plan for cheap production. That the projected concentration is a colossal thing is seen from the statement that this one Company's ideas will run into a capital expenditure of £5,000,000, and that the ultimate capacity of the stations will probably be 100,000-horse power, with turbines of 15,000-horse power or more. The average price—mark the term "average"!—charged in London to-day for electricity is 3½d. per unit; but what the new promoters threaten the old electricity suppliers and the Gas Companies with is current generated by their suggested works at a cost not exceeding ½d. per unit, including coal, wages, repairs, &c. Of course, power and bulk supply is what these Companies are aiming for. Hitherto, we learn, nine-tenths of the electrical machinery in London has been used for the supply of light, and only about one-tenth for power. This being the position to-day, it is almost staggering to be told that it is the opinion of those who have formulated the "big scheme" that it should be possible to give a supply cheap enough to sell ten times the amount of electricity for power as for lighting. It is to be so cheap that "no one will be able to do without it;" and another blessing that is in store is the diminution of the smoke of London. The Gas Companies have done, and are doing, much in this direction; and we do not look to even the £5,000,000 scheme, assuming that it is carried out, accomplishing anything like as good work as that of the Gas Companies in this particular. The maximum price the Administrative County of London, &c., &c., Company, are authorized to charge in their Bill to a ten-hours-a-day user is 1⅛d. per unit; but, "of course, small lighting users will pay a little more to allow for distribution." Well the promised result of this scheme is that "electric light will be generally obtainable in London, in a few years' time, at about 2d., instead of about 5d., per unit, and electric power at well below 1d." Another result which we venture to predict is that, if these various promoters get parliamentary sanction to their schemes, and the public furnish the necessary capital for their development, there will be ere long a beautiful disturbance in electrical finance in London, and more especially so if the Gas Companies follow up the policy of producing a gas which can be distributed at a very cheap rate.

The London County Council have been buzzing round the supply-in-bulk question ever since 1898; and periodically they have been moved in the matter by one consideration or another. Nothing, however, has come of it. On the last occasion that a Bill was introduced by the Council, it was dropped through an expression by the Board of Trade that this was a subject which should be dealt with in a Public Bill. The Government have since had two shots at the idea; but their measure each time has been withdrawn after successfully pilotting it through the early stages. No progress in the matter has thus been made. What the Council would have liked in the past, and would prefer now, would be to be in a position to undertake, if they so determined and if requested by a local authority, the supply of electrical energy in bulk for the convenience of any districts desiring to be supplied. Of course, seeing that the Council have found so much of the money represented by the municipal electricity undertakings of London, any scheme of the sort could not be competitive, but only contributory. The new conditions introduced by the enormous schemes to be promoted in Parliament this year by the Companies mentioned in the preceding paragraph, have come as a shock to the Council and the municipal authorities. Representatives of the Borough Councils had, it will be remembered, a conference on the subject in January, and decided to do something; but about that something there was not altogether unanimity, and certainly there was a good deal of vagueness. The Parliamentary Committee of the County Council now think it is highly important that there should be a conference with the City Corporation and the Borough Councils, with the view to taking common action; and the County Council are in agreement with their Committee. The date of the conference has been left open. There is one thing with which we can heartily agree with the Council's Parliamentary Committee; and it is that the new legislative electrical proposals for London threaten to render more difficult of solution an already complicated state of affairs. The difficulty the County Council and the Borough Councils will have to face is that of the price at which the new Companies are promising to supply. So far as we are aware, there is not a Borough Council in London distributing electricity at less than 1d. a unit for power purposes; while the "promoter" referred to in the foregoing paragraph speaks of the new undertaking in which he is concerned as willing to supply at "well below 1d." With a "unit" of such low degree, the "well below" may represent a very substantial amount on the quantity taken for power purposes; and that would be very inviting for manufacturers who prefer electricity to other forms of motive power. On the other hand, the new Companies are faced by the Government view (which it may be supposed still holds good) that electricity supply in London requires to be dealt with in a Public Bill. But, of course, the Companies have not gone into the schemes with their eyes shut. If complicated, the situation is certainly very interesting.

The increased cost of the public lighting of the city of Chester

is causing a little concern in the Council and among the ratepayers; and the Electrical Engineer has been asked to report on the question. Without any beating about the bush, we assert that that gentleman brings upon himself discredit by, in the year 1905, making comparison between electricity and flat-flame gas-burners. A report on public lighting by any man who in these times descends to this kind of thing can only be looked upon with suspicion, and unworthy of consideration. Who can marvel that in such a comparison gas stands at the bottom! Really, too, one can only treat as a distinct evasion of what incandescent gas lighting can do such a statement as "the increased cost of public lighting by electricity as compared with gas is due to the improved lighting of the thoroughfares." The Electrical Engineer dare not face the truth that a five, six, or seven fold improvement over 13-candle power 4-feet flat-flame gas-burners can be effected by incandescent gas burners at practically the same cost as that of the old flat-flame burners. He states in his report that 115 incandescent electric lamps are being used. These are of 16-candle power only, and cost £2 17s. 9d. each per annum. For this price per lamp gas could make another improvement where these 115 incandescent electric lamps exist in the street lighting of Chester; and we recommend the Electrical Engineer to consider this point, and mention it in the further report which he is to make to the Council, advising them where some reduction can be effected in the cost of the public lighting, which has risen from £2500 in 1896-7 (the last year the lighting was entirely done by gas) to more than £4500 in the last financial year. When the supplementary report is issued, if there is anything worth notice in it, we will return to the subject. It may not have escaped the notice of the citizens of Chester that out of the £229,677 received by the Liverpool Corporation for electricity last year for power, lighting, and traction, only £2372 was spent on public lighting. It would be of interest to some of them perhaps to learn the cause of this.

A footnote to a recent article on the subject of free-wiring (p. 484) was, as then stated, composed of an extract taken from a paper on municipal trading. It showed the number of electrical undertakings under municipal control which are not of the profit-producing order, and specific mention was made of a few. The Glasgow undertaking was of the number, but, as a matter of fact, unfairly so. One of our electrical contemporaries last week published an analysis of the accounts of the undertaking for the year ending May 31 last; and it is seen that great progress was registered during the year. The Glasgow Corporation are one of the few that recognize the necessity of making provision for depreciation; and if others took the same broad view of their obligations, the number would be still less who would be able to make use of that blessed word "surplus" in their accounts. In the case of Glasgow, £32,180 was put aside for depreciation; but it is explained this is "to make up for the comparatively small loan redemption provision on the original loans." Happy must the Committee be that they are in a position to do this. There has also been repaid to the Gas Department £13,895, which was borrowed in the previous year. These two items put an altogether different complexion on the debit-balance (£3554) which has been carried forward.

The Elland electricity undertaking is interesting from the point of view that here we have one of the newer of moderate-sized works which have combined with them a refuse destructor. The accounts of the first year's working and the immediate prospects do not look quite so hopeful as the advocates of the undertaking would like to see them. The total receipts only amounted to £655; and the gross profit to £212. But interest and repayment of principal absorb this, and £670 besides. There has been, according to some of the councillors, a little broadness of view in apportioning the expenses as between the electricity works and the dust destructor plant, in order to make things look as pleasing as possible for the former; and one member asserts that, in addition, £40 too much has been credited for public lighting. There is rather a good joke to be recorded, the author of which is the Chairman of the Electricity Committee. At the beginning of last year, the Elland Gas Company reduced the price of gas 3d. per 1000 cubic feet. It is believed by the gentleman named that this was due to the introduction of electricity; and that the ratepayers may, therefore, accord to the electric undertaking the honour of having produced for them a saving of £1000. We suppose he intends to suggest that this £1000 must be set against the loss on the electricity undertaking. The ratepayers who are not gas consumers will fail to appreciate this view of the beneficent work of the electricity undertaking, and more so if they are called upon to make good in hard cash the deficiency which the supply of electricity to the other ratepayers has occasioned. Of course, some allowance must be made for this being the first year's business in electricity supply, and also for the Chairman's humorous attempt to put as good a face as possible on the position.

The oldest installations of gas-engines operated with coke-oven gas in Germany are those of the Altenwald Kokerei in the Saar district and at Skalley in Oberschlesien, which have been at work for ten years. A large number of similar installations have, however, been erected in recent years. The Ruhr coke-making district is taking the lead in this application of the waste gases to motive power purposes; and installations aggregating over 6000-horse power are now in course of erection.

THE JURY SYSTEM IN GAS-WORKS.

By Joseph Tysoe, of East Greenwich.

[Reprinted from the South Metropolitan Gas Company's "Co-Partnership Journal."]

Not least among the many benefits bestowed upon the employees of the South Metropolitan Gas Company by a sympathetic Board of Directors may be reckoned the institution of the system of inquiry into all accidents which occur to employees while engaged in their work, and the determination of the cause thereof, and apportionment of the blame, if any, by a jury of fellow-workmen. From its first inception, this appealed to me as a procedure which could not fail to be productive of good results, and, like many another scheme, the wonder is that it had not been thought of before. The records show that since the commencement there has been a gradually decreasing percentage of accidents; and it is impossible to avoid the conclusion that many workmen have cause to-day to be thankful for their immunity from accident to the inquiry system.

Although much has been accomplished, it must not be thought that perfection has been reached. There are still too many accidents of a preventable kind, which, for the credit of all concerned, should be, and can be, reduced. By some, the importance of co-operation appears to be imperfectly understood; and, presiding as I do over these inquiries (more frequently be it said than is desirable), I am in a position to speak with some authority. More than once when examining a witness, I have elicited the statement that he was not surprised at an accident taking place, because he had for some time thought that something should be done to afford greater security; but it did not occur to him to speak to some one in authority about it! This is a deplorable admission, and strikes at the root of the whole matter. I am afraid there still exists among certain workmen the feeling that a complaint of any sort to a foreman will be resented. In the interests of co-partnership, I can only say that the sooner an instance of that kind is brought to light, the better it will be for all concerned, except possibly the foreman.

In the book of rules of the accident fund, co-operation on the part of the workmen is specially requested; it being recognized that men closely engaged upon a job have better facilities for becoming acquainted with weak spots than has a foreman who is giving general supervision. This request cannot be too strongly emphasized; and if anyone in authority should resent such co-operation, he is not, in my opinion, fitted for the position he holds, whatever it may be. Co-operation on these lines will be more effective in providing safeguards than any Factory Act; and I think it would be an excellent thing if, instead of adding more vexatious conditions to an Act which already sufficiently impedes operations, our legislators would compel all employers of labour to introduce our system of inquiry into all accidents, as I am certain the result would be a great diminution in the returns.

GAS SECURITIES.

In its Financial Supplement last week "The Times" made some pregnant observations upon the present position of gas securities. The object of the leading article in which these occur was to direct the attention of investors to some sound 4 per cent. securities—gas, water, and electric lighting. The attractions of "sweetness and light as investments" are dwelt upon; and in regard to the latter, as represented by gas, it is pointed out that whereas in the early days of electric lighting shareholders in gas companies sold out in the belief that the days of gas as an illuminant were numbered, "the incandescent mantle, the gas-stove, and the gas-engine have changed all that," and "the investor who wants a gas security returning a fixed income of 4 to 4½ per cent. has to go abroad to find it if he confines his attention to the London Official List." It is suggested that the superiority of gas over electric lighting undertakings as an investment is to some extent due to the fixity of tenure enjoyed by the former; the home electric lighting undertakings being usually limited to a term of years, in which to enjoy their privileges. However this may be, it scarcely accounts for the great increase in the value of nearly all gas securities—foreign as well as home—which has occurred during the last few months, commencing with the appreciation of the stock of the Gaslight and Coke Company, which took place almost concurrently with the opening of the International Gas Exhibition last November.

This is a circumstance which lends colour to the belief that has been expressed in various quarters that the exhibition has not been productive of benefit to the gas industry in the Provinces but only to that of London and its suburbs. There could, however, hardly be a greater mistake than to suppose that its permanent effect is likely to be so circumscribed. It is probable enough that its results have appeared first of all in the neighbourhood in which it was held, seeing that the consumers residing in this formed, as was only to be expected, the bulk of its visitors. In this view, indeed, its immediate influence may almost be described as diminishing, like the illuminating power of a gas-

burner, according to the square of the distance to be traversed. But to say that, because the numbers who attended the exhibition from distant parts of the kingdom were comparatively few, therefore its effect in those distant parts was and will continue to remain *nil*, seems to argue a lamentable want of appreciation of the penetrative power of the rays which emanated from Earl's Court during this memorable show. These rays did, in fact, extend far and wide; and they have proved to be by no means evanescent. They revealed to the public, as nothing else has done or could do, the great advantages of incandescent gas lighting; and this, perhaps more than anything else, has inspired investors with a degree of confidence in gas securities which was previously lacking. A great stimulus was, indeed, imparted to the use of gas for all purposes—lighting, heating, and motive power—by the exhibition; and this is certain to be felt wherever a supply of gas is at present available.

We do not say that the great advantage which the Earl's Court Exhibition secured to the gas industry by its publicity of the capabilities of gas should not be followed up by local displays. These we hold to be necessary for the purpose of enlisting local sympathy; especially, perhaps, with regard to incandescent lighting, engaged as this is in competition with electric lighting. Nor has a period by any means been put to the usefulness of the Institution of Gas Engineers in this connection by the winding-up of the exhibition accounts. Electrical engineers profess to have recognized in this exhibition advertisement for their system of lighting on hygienic grounds. This is a subject which has not hitherto engaged the attention of gas engineers to any extent; but an excellent beginning has been made—thanks to the enterprise of the South Metropolitan Gas Company—by the researches of Drs. Hehner and Rideal into the sulphur question. There is, however, more to be done. Further investigations are needed, not only as to the effect of gas lighting—whether incandescent or flat-flame—upon the air of a room, but also as to the best means of employing gas for heating purposes. This is work which the Institution might very suitably take up; and for the prosecution of which any funds that may be left over from the amount subscribed to defray the expenses of the exhibition would be very properly employed.

THE ELECTRICAL TRADES' DIRECTORY.

We have had occasion, for some years, to direct our readers' attention to the "Electrical Trades' Directory and Handbook," published annually by the "Electrician" Printing and Publishing Company, Limited, of Salisbury Court, Fleet Street. It is familiarly known as the "Big Blue Book;" and it certainly merits the title. The 23rd edition has just been issued; and its 2000 pages have been thoroughly revised and the contents brought up to date. Among the features of the book of special interest to our readers are complete notes of the past year's progress in electric traction and electric power, the development of the steam-turbine, the progress made in electric lamp improvements, &c., and a summary of the legislation of the past session as bearing upon the electrical industry. The law of electric lighting, power, traction, &c., is fully dealt with, and a digest, specially prepared by Mr. A. C. Curtis-Hayward, Solicitor, is given. The principal legal decisions affecting the industry are also summarized. The subject of patent law and expiring patents, of rules for the installation of electric light, power, and traction in this country, the fire-risk rules of all the leading Fire Offices, as well as those which govern electrical installations in the United States, Germany, France, Switzerland, and other countries, and also in the British Colonies, are included. Full financial details relating to electrical joint-stock enterprise, and ample information relating to the financial side of every branch of the electrical industry are to be found in the book, including a Directory of Directors of Electrical Companies, particulars of the capital authorized and issued, the last dividends paid, the latest Stock Exchange quotations, and all the principal officials. The "Directory Division" contains the name and address of every known person engaged in the electrical profession and industry throughout the United Kingdom. There is also included a "Biographical Section," giving sketches of the careers of the leaders of electrical engineering enterprise at home and abroad, obituary notices, and other information. Finally, a graphic survey of the engineering and electrical equipment of all the electricity supply, electric power, and electric traction undertakings of the kingdom is given in the form of five large tables, to which reference has lately been made in our "Electric Lighting Memoranda;" the details presented being very comprehensive. One of the tables is devoted to Colonial undertakings of the same character. The "Directory" has for 23 years occupied a prominent place as a work of reference; and the edition for 1905 shows that there is no slackening of the Editor's efforts to keep up the high reputation of the work.

At the luncheon which followed the recent half-yearly meeting of the Portsea Island Gas Company, the health of Mr. C. Jenkins, who is retiring from the position of Secretary, was heartily drunk, and he was wished success in whatever he might take in hand in the future. Mr. Jenkins expressed his thanks for the compliment that had been paid him.

PERSONAL.

Bailie Hamilton has been appointed Convener of the Gas Committee of the Corporation of Hamilton, in succession to the late Mr. James MacHale, whose death was announced in a recent number of the "Journal."

After a service extending to more than twenty-three years, Mr. Thomas Hewson has resigned the position of City Engineer of Leeds, on account of failing health. Last autumn, he was granted three months' leave of absence; and, with the view of relieving him of some of his duties, which embraced those of Water-Works and Sewerage Engineer, it was decided to divide the work by the appointment of two additional officials. But he has felt that the present step is inevitable; and the announcement that he has decided to take it has been received with regret by all who have had opportunities of witnessing the diligent and faithful service he has rendered to the city.

OBITUARY.

It is with much regret that we record the death on Friday, at his residence "Sherwood," Henley-on-Thames, after a long illness, of Mr. Basil T. Makins, the eldest surviving son of Colonel Sir Thomas Makins, Bart., the Governor of the Gaslight and Coke Company. The deceased gentleman was personally known to many of our London readers from his connection with the Brentford, Lea Bridge District, and Malta and Mediterranean Gas Companies. He was at one time on the Boards of all these Companies; but ill-health compelled him to retire from active participation in their management. He was also a Director of Messrs. Glover and Main, Limited. He succumbed to heart failure at the early age of 36. We offer our sincere condolences with Sir William Makins and the members of the family in the great bereavement they have sustained.

By the death of Mr. James Somerville, at his home in Indianapolis, on the 13th ult., of heart failure, a connecting link between English and American gas engineers has been broken. Deceased was a brother of Mr. John Somerville, who was for some years one of the Engineers of the South Metropolitan Gas Company; and he had held the position of Superintendent and Engineer of the Indianapolis Gas Company since 1879. He was a member of the American Gaslight Association, having joined it in 1875. He was born on April 1, 1840, and was consequently in his 65th year. In a brief notice of his death which appears in the last number to hand of the "American Gaslight Journal," he is spoken of as "a man whose services to the gas fraternity of the United States, and whose fellowship thereto, were of the order that will long keep his memory dear to them."

We learnt with regret, a few days ago, of the recent death of M. Gustave Jouanne, the Technical Editor of "Le Gaz," with which publication, as well as with the two others associated with it—"Le Constructeur d'Usines à Gaz" and "L'Annuaire General de l'Industrie de l'Eclairage et du Chauffage par le Gaz"—he had been connected for some years. These works, as our readers are probably aware, were started by M. Emile Durand, who in the conducting of them had the valuable assistance of M. Jouanne, who was an engineer by profession. When the advancing age of M. Durand necessitated the relinquishment of the management, M. Jouanne was retained by his son (M. Paul Durand), on whose death about two years ago he continued to advise Madame Durand on all technical matters connected with the business. In addition to his literary duties, M. Jouanne, who was the owner of the gas-works at Fouras et Surgères (Charente-Inférieure) carried on business in Paris. He was a member of the Société Technique du Gaz en France, having joined that body in 1884, and brought under the notice of his colleagues at the anuual meetings some of the latest improvements in gas plant and appliances.

The death on Thursday last, at the advanced age of 87, of Sir Charles Frederick Hamond, formerly Conservative member for Newcastle-on-Tyne, calls for brief notice in these columns from the fact that he was a shareholder in several gas companies, and his venerable figure was a familiar one at London meetings, until failure of sight compelled him to absent himself. He was born in Kent in 1817, and went to Newcastle in 1838 as the agent of his father, who was an extensive shipowner in the Metropolis. His excellent business qualities soon attracted attention; and he was the means of giving a powerful impetus to the industry of the North. It was really he who created the Spanish coke, coal, and lead trade. At the outset of his career, he imported silver into Newcastle at the rate of £200,000 per annum, and he exported many thousand tons of coal and coke each year. He entered the Town Council in 1852, and Parliament in 1874. He was defeated at the General Election in 1880; but he was returned in 1892 at the head of the poll. The affliction already referred to compelled his retirement from Parliament in 1900; but he continued to give his services to the public with wonderful vitality to the last. His memory was extraordinary, and it never failed him. He was called to the Bar by the Middle Temple in 1865, and received the honour of knighthood in 1896. He was Newcastle's senior Magistrate, and sat on the bench as recently as last Friday week. On Tuesday he caught a chill, and passed away peacefully after two days' illness.

ACCOUNTS OF THE METROPOLITAN GAS COMPANIES FOR THE YEAR 1904.

—	Chartered.	Commercial.	South Metropolitan.	All the Companies.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Capital and borrowed money (including premium capital)	27,553,847 11 9	2,511,754 5 4	8,082,700 0 0	38,148,301 17 1
Income—viz.:				
Total gas rental	3,052,783 3 2(a)	353,159 4 0(d)	1,204,524 5 1(f)	4,610,466 12 3
Rental of meters and stoves	65,832 13 10(b)	30,195 13 11	109,023 15 1	205,052 2 10
Residual products	832,159 18 4	100,333 9 2	532,964 17 0	1,465,458 4 6
Miscellaneous, including old materials	19,598 7 9	870 7 6	12,573 13 0	33,042 8 3
Total income from all sources	3,970,374 3 1	484,558 14 7	1,859,086 10 2	6,314,019 7 10
Expenditure—viz.:				
Coal and oil, including carriage and dues	1,255,603 1 3	168,214 3 8	653,768 14 5	2,077,585 19 4
Purifying materials, including labour	100,049 8 1	10,216 18 3	42,220 8 1	152,486 14 5
Salaries and wages—manufacture	306,572 4 5	39,756 0 6	144,281 1 1	490,609 6 0
Wear and tear—manufacture	350,435 8 3	60,865 5 8	227,353 10 5	638,654 4 4
Rents, rates, and taxes	300,762 2 0	19,374 15 5	76,208 2 0	396,344 19 5
Salaries—management	14,483 11 1	2,201 1 6	6,199 7 6	22,884 0 1
Collectors' salaries and commission	48,680 19 8	5,601 17 8	23,844 17 0	78,127 14 4
Stationery, printing, and general charges	22,041 14 6	4,088 3 4	22,433 7 4	48,563 5 2
Directors and auditors	5,935 14 0	2,650 0 0	5,196 10 0	13,782 4 0
Salaries and wages, wear and tear—distribution	234,031 11 0	21,043 5 10	107,346 7 11	362,421 4 9
Repair and renewal of meters and stoves, &c.	123,522 11 3	24,424 17 1	95,075 16 3	243,023 4 7
Law and parliamentary charges	3,873 13 7	1,321 18 7	7,528 13 8	12,724 5 10
Bad debts and extraordinary expenses	52,441 6 10(c)	10,854 11 1(e)	51,803 6 1(g)	115,099 4 0
Total expenditure on revenue account	2,818,433 5 11	370,612 18 7	1,463,260 1 9	4,652,306 6 3
Gross profit	1,151,940 17 2	113,945 16 0	395,826 8 5	1,661,713 1 7
Do. per cent. on capital and borrowed money	4 3 8	4 10 9	4 18 0	4 7 2
Do. do. gas-rental	37 14 8	32 5 4	32 17 3	36 0 10

(a) Including £137,240 received for public lighting and gas supplied by contract. (b) Stoves only. (c) Including annuities, £37,773, and £1420 on workmen's compensation account. (d) Including £14,371 (less discounts and allowances) for public lighting, &c. (e) Including £5403 paid under the profit-sharing scheme. (f) Including £30,143 for public lighting, &c. (g) Including £11,200 paid to pension, &c., funds, and £36,341 paid under the co-partnership scheme.

TABLE *showing the Capital, Income, Expenditure, and Profit per Ton of Coal Carbonized (including Oil), in* 1904.

—	Chartered.	Commercial.	South Metropolitan.	All the Companies.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Capital and borrowed money	13 13 8·67	9 13 2·30	6 18 4·30	11 1 8·22
Income—viz.:				
Total gas rental	1 10 3·92	1 7 1·96	1 0 7·42	1 6 9·50
Rental of meters and stoves	7·85	2 3·87	1 10·39	1 2·30
Residual products	8 3·20	7 8·61	9 1·49	8 6·19
Miscellaneous, including old materials	2·34	0·80	2·58	2·31
Total income from all sources	1 19 5·31	1 17 3·24	1 11 9·88	1 16 8·30
Expenditure—viz.:				
Coal and oil, including carriage and dues	12 5·68	12 11·26	11 2·29	12 0·87
Purifying materials, including labour	11·93	9·43	8·67	10·63
Salaries and wages—manufacture	3 0·54	3 0·70	2 5·64	2 10·21
Wear and tear—manufacture	3 5·77	4 8·18	3 10·70	3 8·54
Rents, rates, and taxes	2 11·85	1 5·88	1 3·65	2 3·64
Salaries—management	1·73	2·03	1·27	1·60
Collectors' salaries and commission	5·80	5·17	4·90	5·45
Stationery, printing, and general charges	2·63	3·77	4·61	3·38
Directors and auditors	0·71	2·45	1·07	0·96
Salaries and wages, wear and tear—distribution	2 3·90	1 7·42	1 10·05	2 1·27
Repair and renewal of meters and stoves, &c.	1 2·73	1 10·54	1 7·53	1 4·95
Law and parliamentary charges	0·46	1·22	1·55	0·89
Bad debts and extraordinary expenses	6·25	10·02	10·65	8·03
Total expenditure on revenue account	1 7 11·98	1 8 6·07	1 5 0·58	1 7 0·42
Gross profit	11 5·33	8 9·17	6 9·30	9 7·88

TABLE *showing the Increase or Decrease in each Item during* 1904 *compared with* 1903.

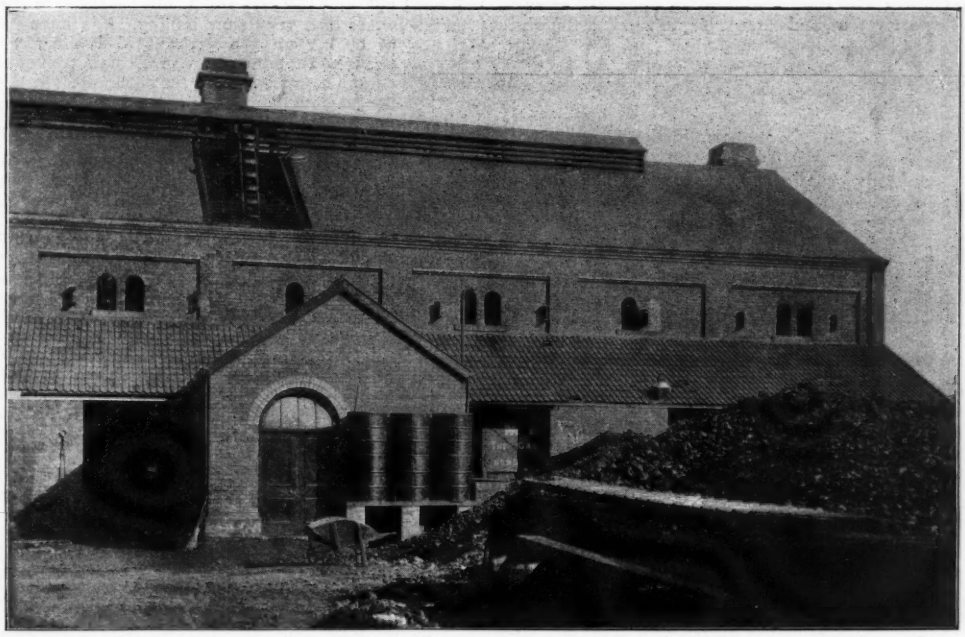
—	Chartered.		Commercial.		South Metropolitan.		All the Companies.	
	Inc.	Dec.	Inc.	Dec.	Inc.	Dec.	Inc.	Dec.
	£	£	£	£	£	£	£	£
Capital and borrowed money	..	..	67,784	..	100,000	..	167,784	..
ncome—viz.:								
Total gas rental	..	1,021	4,493	..	..	105,746	..	102,274
Rental of meters and stoves	6,011	..	5,752	..	9,721	..	21,484	..
Residual products	..	31,257	..	15,073	..	3,541	..	49,871
Miscellaneous, including old materials	2,529	..	..	262	..	787	1,480	..
Total income from all sources	..	23,738	..	5,090	..	100,353	..	129,181
Expenditure—viz.:								
Coal and oil, including carriage and dues	..	39,813	..	3,210	..	20,943	..	63,966
Purifying materials, including labour	2,372	..	..	4,984	1,333	..	..	1,279
Salaries and wages—manufacture	..	9,580	..	89	2,945	..	..	6,724
Wear and tear—manufacture	..	5,025	6,473	..	..	14,191	..	12,743
Rents, rates, and taxes	13,543	..	773	..	..	2,061	12,255	..
Salaries—management	..	8,890	25	..	121	..	..	8,744
Collectors' salaries and commission	8,275	..	703	..	2,090	..	11,068	..
Stationery, printing, and general charges	237	..	538	..	2,813	..	3,588	..
Directors and auditors	4	..	..	..	..	93	..	89
Salaries and wages, wear and tear—distribution	30,615	..	2,310	..	..	26,151	6,474	..
Repair and renewal of meters and stoves, &c.	8,609	..	5,769	..	..	2,357	12,021	..
Law and parliamentary charges	..	3,022	359	..	3,501	..	838	..
Bad debts and extraordinary expenses	..	5,632	1,314	..	4,457	..	139	..
Total expenditure on revenue account	..	8,307	9,981	..	..	48,836	..	47,162
Gross profit	..	15,431	..	15,071	..	51,517	..	82,019

THE "D.B." MACHINERY AT NEATH.

The Application of Machinery in Small-Sized Gas-Works.

The introduction of power stoking machinery into retort-houses of the smaller size is rapidly becoming an accomplished fact, thanks—as Mr. Thomas Berridge said in his recent presidential address to the Midland Association of Gas Managers—to such machines as the "D.B." coal-projector. An example is the Otley Gas-Works," where the "D.B." machine is installed in a retort-house of only five beds of eight retorts, 10 feet long. To-day, too, it is a pleasure to illustrate and describe the retort-house at the Neath Corporation Gas-Works, in which stoking machinery has recently been installed to the designs of the Engineer, Mr. Robert A. Browning, Assoc.M.Inst.C.E.

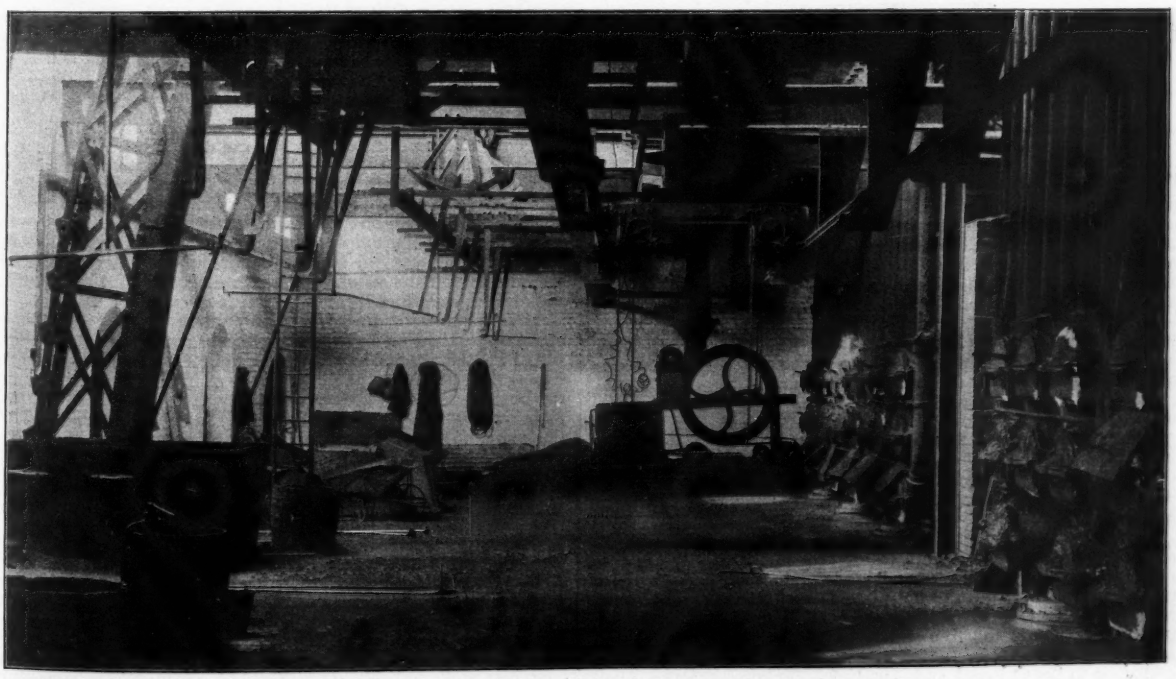
The house at Neath consists of a range of eight beds of eight retorts of ⏍ section, each 10 feet long, with a coal-store under



The Retort-House Exterior, with Elevator in Roof.

the same roof served by a railway, which is 3 ft. 9 in. below the retort-house floor. The coal falls direct from the railway trucks into a hopper, which has beneath it a feeding-screen, through which the small coal passes direct to the elevator, while the lumps only go through the usual single-pair claw breaker. The coal is then elevated and delivered into a push-plate conveyor, by which it is distributed into a continuous hopper, holding a twenty-four hours' supply overhead in front of the benches. The hopper is fitted underneath with 24 measuring-chambers, each of a capacity of 4 cwt., with adjustment by means of slides to 2½ cwt.; there being one measuring-chamber opposite each vertical row of retorts. The levers for controlling the measuring-chambers are so controlled by means of levers and quadrants that an absolute measure is attained, as the top doors must be completely closed and at rest before the bottom ones can be moved, and *vice versâ*.

The charging-machine is of the original De Brouwer type, suspended from a travelling carriage running on rails overhead. The



The Interior of the Retort-House, with the "D.B." Plant at Work.

principal improvement in the machine is in the projecting belt, which has been made capable of dealing with nearly three times the weight of coal before being worn out. The current supplied to the machine by overhead wires in the usual way, is generated by a gas-engine of the high-speed electric lighting type, direct coupled to a continuous current dynamo of sufficient capacity to drive a discharging-machine and an electric haulage capstan in addition to the projector. The coal-handling plant is driven by a belt from the same gas-engine.

On the first starting of the plant on Jan. 21, the stokers raised some difficulty as to the amount of work they would be called upon to do under the new arrangement; but, after discussion with the Gas Committee, who were disposed to share the advantages of the new machinery with their workmen, an amicable arrangement was quickly arrived at, and since it began running the whole

The Engine and Dynamo at Neath.

plant has worked with complete satisfaction—the charging being done during the first few days by the contractors' staff; but since then by the stokers themselves. The charges, Mr. Browning informs us, have, without exception, been excellent; and the machine has proved itself to be under complete control—either light or heavy charges being put in by the stokers at will.

The introduction of the plant and the methods of working reflect great credit upon Mr. Browning, whose foresight in providing his Corporation with every suitable modern improvement in the works, it appears certain, will bring to them a substantial pecuniary advantage, and to him increased professional credit.

The installation is in full working order, and Mr. Browning expresses the pleasure he will have in showing it to any gas manager who would like to inspect its working.

COOKERS, METERS, AND GROOVES OF CUSTOM.

By W. G. Quicke,

Engineer of the Perth (W.A.) Gas Company.

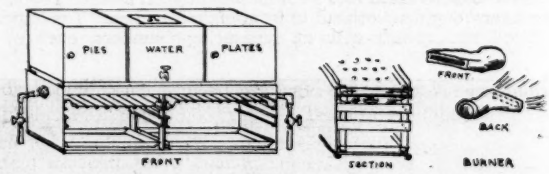
In our little, remote centre there is considerable delay in obtaining detailed information. Consequently we are driven to experiment for improvements, and to somewhat depart from the accepted rules and methods, which, under the cast-iron *régime* of custom and prejudice, ignore our local conditions, both climatic and monetary. It is in relation to the structure and cost of British in comparison with Colonial and American cookers, and of the material used in the construction of both dry and wet meters, prepayment, and ordinary, that I desire to create an interest that will lead to improvements in these respects, as these appliances are costly to importers, owing to the heavy breakage account. In the case of cookers, the question is one both of prime cost and economy in working—the consumers' interests, on the score of popularity, being paramount; and our price of 5s. 10d. per 1000 cubic feet makes it even more imperative than in Britain. Unfortunately, we have a tariff of 20 per cent., which does not improve matters. But as this applies to American in common with British goods, the question is one of construction and metal used.

British workshops favour cast iron, which entails extra weight; and the tendency is to adhere to existing methods. As regards the oven, beyond the meagre and inadequate shelf-bearers, there is little to criticize; but the hot-plate is ineffective, cumbersome, and subject to easy breakage in transit. Unfortunately, we experience this only too frequently, as the heavy repair list will show. It is this fact, coupled with the lower price, which compelled us to try Colonial and American gas-cookers; and I will endeavour to outline what are, to my mind, the main features of these machines, and show where they are superior to British productions.

In the first place, the American oven is completely enclosed. There are two bunsen inlets, to enable the consumer to more effectually control the oven. Secondly, the grills are also enclosed, thus impelling all fumes to the flue, and more effectually and economically utilizing the gas, as the door may be open or closed at will. Thirdly, the side brackets for the trays are closer together, and permit of more ready adjustment. Fourthly, the hot-plate is enclosed on three sides, so that draughts cannot interfere with proper working. Finally, the bunsen burners are all adjustable, enabling the consumer to regulate the supply of air at will, which inculcates the principle of care and economy. I must not omit the very small tube addition to the hot-plate for small vessels and very slow boiling. We have used this class of cooker on the works; and I can say most unhesitatingly that the average British cooker of equal size cannot compete with it for economy. In addition to this, the framework and hot-plate are of cast malleable metal, which not only lessens the weight, but is proof against breakage. It may be urged that the steel sides will deteriorate. But even this replacement would not be a large item here; and up to the present (two years), there is no appreciable necessity for it. In addition, the cost delivered on the works from the United States is 30s. less than that of the same size of British cooker.

The Colonial cooker, as manufactured by Victorian firms, has much in common with the American—substituting cast iron for cast malleable metal; the oven being more British in pattern, with the difference that the grill is beneath the crown of the oven, and can be used for either grilling or baking. The hot-plate resembles the American by being enclosed; and the body is also made of sheet steel, with cast-iron front and hot-plate. These are fairly economical cookers, and greatly in demand. Owing to interstate shipment only, these goods do not carry any tariff.

In catering for restaurant consumers, it is not always possible to obtain a cooker by any firm that will meet requirements. It is either too costly in construction or wasteful in gas consumption, and the average cooker is too small. In securing an open order to fit a restaurant kitchen, I designed a sheet-steel cooking apparatus, which was made on the works, with single bunsens at each side only, the flame striking against a $\frac{1}{8}$-inch crown plate 12 inches wide and 18 inches long, the two combined forming a double machine without partition, and being 3 feet long. The bunsen being so placed, the grills are adjustable to $1\frac{1}{2}$ inches and lower as required. The crown plate is spaced $1\frac{1}{2}$ inches from the outer casing proper; and by notching out $\frac{1}{2}$ inch at the sides, the fumes and heat are permitted to traverse this space, and escape through perforations on the top prepared for the purpose, and the vessels placed on the top intercept the heat, as shown by the accompanying sketch. This apparatus has an open front below the crown plate, and is used for grilling and toasting only.



As we settle down to civilizing influences, our wants increase in proportion; and the day is not far distant when we hope to adopt slot meters on the usual lines. But before embarking on such a venture in our own particular district, I should prefer to have a more substantial machine in so far as the material and its fixings for the cash-box are concerned; and it is this desire for information which prompts this communication. Breakage, again, is our main bugbear. Now, why cannot these appliances be made more solid, and the whole apparatus constructed of cast malleable metal, cash-box included, so that a common tin-opener at least is insufficient to extract the contents? Not only would such a construction be proof against broaching, but the whole would be lighter, and never at any time subject to breakage or damage. I see many patent locks more or less perfect to secure tin boxes; but the boxes, especially in our climate, become rusted very quickly, apart from the easy access afforded. Perhaps, the many manufacturers of prepayment meters could improve upon my suggestion, and pave the way for a great advance on existing designs.

Mr. Dugald Clerk's Cantor Lectures at the Society of Arts.—Last night, Mr. Dugald Clerk delivered at the Society of Arts the last of his course of Cantor Lectures on "Internal Combustion Engines." We have already noticed the first lecture; and an abstract of the second, dealing with indicator diagrams, is in type. In the third, delivered on the 27th ult., Mr. Clerk gave examples of the various kinds of internal combustion engines; and last night he indicated the lines of future developments. These lectures will be noticed more fully in subsequent issues.

THE LADY LECTURER AND TEACHER:

HER SERVICES REGARDED FROM ANOTHER POINT OF VIEW.

By NORTON H. HUMPHRYS, Assoc.M.Inst.C.E., F.C.S.

In common with all who are concerned in the matter of letting gas-stoves on hire, or encouraging the use of the same on any terms, I have read with much interest the editorial introduction of this subject, and the views of various lady lecturers which have appeared in recent numbers of the "JOURNAL." There can be no question as to the value of the assistance afforded by ladies of this persuasion in the past, or as to the possibility of such services being rendered still more useful in the same connection in the future. But there are one or two other considerations that may be faced, with advantage, before deciding upon a novel and extended field of operations.

Starting from the well-known fact that gas-cookers are used with acceptation, wherever the price of gas is moderate, by 50 per cent. and upwards of the total number of consumers, it is open to question why they should not be equally useful to a large proportion, at least, of the remainder. To put it another way, nearly 50 per cent. of the consumers do not at present use gas-cookers; and the object of this discussion is to ascertain whether anything can be done, in addition to the efforts already put forth, in the way of diminishing this percentage. Opinions differ, of course, as to the causes; but it is usual to regard ignorance and lack of educational influence as a main factor. This assumption I venture to challenge, and to suggest that if the average consumer is ignorant as to the proper way of using the gas-cooker, such an unfortunate state of affairs is due to negligence or indifference on his part more than to lack of means of obtaining efficient information or instruction from the parties who supply the gas.

To begin with, the mere fact of deciding to order a gas-cooker implies some acquaintance with the correct way of using it. People do not order a thing they know nothing about. The consumer may have fallen a victim to the eloquence of the lady lecturer, or of a salesman at an exhibition or at the gas office; but more frequently the decision is brought about by the recommendation of a relative or neighbour. Mrs. A tells Mrs. B how useful she finds the gas-stove, or A tells B, who happens to work at the next bench or desk to his, of the domestic comforts that follow the installation of a gas-cooker, and that the said comforts are available, by arrangement with the gas company, without any initial outlay. The result in either case is that B, very wisely, resolves to have one. The object of further effort is to encourage and stimulate this desirable state of things; and it is recognized that if A can only be induced to use his stove to the best advantage, the conversion of B, and eventually of C and D, and so on, will follow as a matter of course. As a further help, it has been the custom of all the principal makers for the last twenty years at least to send out a printed card of instructions with each article; so that when B gets his cooker, he receives with it a list of rules, clearly and concisely worded, that tell him all that is needed as to the proper way of using the stove, keeping it clean and in order, and so on. No one, after perusing these with reasonable care, can plead ignorance as an excuse for negligent or improper usage. In addition to this, it would not be easy to find a consumer who has not received a free invitation from the local gas company to attend a course of demonstrations by a competent exponent. With all this, there is a great deal of neglect, especially in regard to hired apparatus, as everyone who has had experience in maintaining 1000 cookers or more for a period of years will admit. But it is due to not having attended to the means of instruction already existing, rather than to the lack of such means.

In the course of her regular round, the lady lecturer meets but a very small percentage out of the whole body of users. Take a town of 20,000 inhabitants and perhaps 3000 consumers. If the usual advertisements and tickets of admittance are issued from the gas office, announcing a course of demonstrations, what proportion of the 3000 will be taken at the doors? A room with sitting accommodation for 300—10 per cent.—is not likely to be uncomfortably overcrowded. Out of this number a goodly proportion have come on account of idle curiosity, or for the same reason that they would go and listen to a band in the park, or attend any other free entertainment, rather than from a desire to become real learners or to profit by the lessons. A second deduction must be made for those who are interested in cookery only; the gas-stove being a very secondary consideration. This brings us down to the small percentage who really accept the avowed objects of the demonstration, and are willing to be instructed as to the proper methods of using a gas stove. One naturally feels diffident in criticizing a lady's performance; but after sitting out several demonstrations, it has seemed to the writer, who may perhaps be prejudiced, not that there is too much about cookery, for that is one of the good things that it is impossible to have too much of, but that there is too little about the avowed object of the demonstration—the gas-stove, the need for competent supervision in the matter of cleanliness, and other working details. Very possibly the lady understands her audience, and acts wisely in relying more upon indirect advertising by gentle suggestion than by plainly advocating the gas-cooker, and her methods are suited to the more intelligent and advanced section of the whole who regularly attend her classes. But if she was to inspect a fair average lot of cookers returned after two or three years ordinary use, she might give more prominence to these points. Be that as it may, however, the visitors usually have opportunity of asking questions after the lecture; and between the gas office, the instruction card, and the cookery demonstration, they can obtain all necessary information. If they will not do so, it is not the fault of the gas company.

The chief obstacles to my mind in the way of a more extended use of gas-cookers are the lack of proper house room, and indifference on the part of present users. As to the first point, it is remarkable, with the fact above instanced in view, that 50 per cent. of the consumers, representing at least 30 per cent. of the total householders in a district, depend entirely or chiefly upon the gas-cooker for all the viands that are prepared in the house, that no proper housing is provided for it. While the discarded kitchener enjoys all the dignities of a proper brick-setting and a separate flue, there is no proper location for the gas-cooker, which is dumped anywhere in the kitchen or scullery, sometimes without even a connection for the oven flue-pipe. The result is that steam from cabbages or odours of frizzling fat are diffused into several rooms, and the chance visitor determines in her own mind—though she may not say as much—that she will not have a gas-cooker on any consideration because of the smell. If the lady lecturer can bring her gracious influences to bear upon architects and builders, to provide proper housing for the gas-cooker, and thus remove this objectionable feature, she will greatly help the cause. The fact that, notwithstanding this great drawback, the gas-cooker is largely used, does not affect the conclusion that, in the absence of such disadvantage, its adoption would be further enhanced. As it is, in country districts at any rate, not one stove in 100 is properly set, with adequate provision for removing the products of combustion and culinary vapours from the apartment in which it is fixed. The electrician who had the pleasure of being "made ill" at Earl's Court Exhibition went to a lot of unnecessary trouble, because he could probably have secured the desired effect without going into another street.

And what about the utter indifference of the consumer? One chances now and then to come across a cooker that is well cared for, clean on the inside and as bright as a new pin on the outside; but the majority present unmistakable evidence of being left to the tender mercies of the maid-of-all-work. Put out (say) a dozen cookers with polished facings on the 1st of January, and then go round about June or July and note that in most of them the bright surfaces have not even had the rub of a leather since they were fixed. The artisan's wife as a rule cleans up her own house, and under such circumstances the cooker gets well cared for. The actual user is directly interested in keeping all in order and good condition; and therefore the best advertisement of an efficient stove in actual use is to be found among the slot consumers. This may not be the sole reason, but undoubtedly has something to do with the fact that among the slot users the cooker is more largely in demand than with the others. I have said that 50 per cent. of the consumers or more use cookers. But taking slot consumers alone, more like 90 or even 95 per cent. use them.

Why should there be such a difference? Surely, it cannot be said that the gas-cooker is more suited to the poor than to the wealthy. Coming to the small semi-detached villa, we find that as a rule the lady of the house is not above doing a great deal of the cooking herself and that, as in the former case, the cooker receives attention from, and is under the care of, a user directly interested in it. As regards the small shopkeeper, the mistress usually "assists" in the business, to the detriment of household affairs, which are left to the untrammelled genius of a "general," who, unlike other generals, is frequently young or inexperienced. Here the very simplicity and accommodating nature of the gas-cooker tells against it, and what is wanted is an appliance that will either burst in two or spoil the food—the latter preferred, if not kept in reasonably decent order. A kitchener must be properly cared for—flues cleared once a week, &c.—or there will be trouble with the cooking, volumes of smoke, or other evils that enforce immediate attention. But the gas-stove continues to give satisfactory results until the burners are actually choked with grease and dirt. If it "smells," the annoyance is, unfortunately for the gas company, ascribed to some peculiarity inherent to the appliance, rather than to the correct cause. The cooker is not likely to be rejected. The convenience of being able to prepare food at a moment's notice day or night, with absolute certainty as to regulation of heat, is such that the cooker is retained as indispensable, notwithstanding its supposed defects. But the odour from the dirty cooker does not facilitate business if Mr. and Mrs. B. come along; and much prospective custom may be lost to the gas company.

Going higher in the social scale, to a large establishment where the kitchen is a separate department, under the care of a housekeeper or professional cook, one frequently meets with unmistakable evidence that it is no one's special duty to care for the gas-stove. The lady of the house never sees it, and asks no questions so long as meals are properly served. She has her public and social duties, or may be her bicycle and hockey, to occupy her time; and so it comes to pass that, as in the case of the small shopkeeper, the stove is out of touch with the parties actually interested in the gas bill. Perhaps the exterior may get a hurried rub up on the occasion of her periodical visit to the kitchen. But a glance and a sniff do not go far enough; and all the cleaning the interior out-of-sight parts receive is done by the gas

company, who quite understand the meaning of a complaint received once a year or so, that the stove is "out of order." They know that a plain statement as to the real condition of affairs would upset the powers that be, and result in the unsparing condemnation of the appliance, and they prefer to accept the onus of "repairing" the stove rather than risk the loss of a really good customer.

One would like, then, to know something as to the extent to which advantage has already been taken of the available means for instruction and information. The Earl's Court Exhibition was an unusual opportunity, and many companies in the neighbourhood of London issued free tickets to their customers. It would be a useful guide as to future operations, if statistics could be collected showing: (1) Distance from the exhibition. (2) Number of free passes issued. (3) Number actually presented. (4) Whether the tickets were presented by the recipients personally, or simply given away to servants or dependents. A similar analysis might with advantage be applied to any local effort. And the investigation might also extend to the standing and occupation of users and non-users respectively. In going after "the other 50 per cent.," much unnecessary work would be incurred if the whole body of consumers were dealt with. I have already noted that the slot consumers use gas-cookers to a man, or, more accurately, to a woman; so it would be superfluous to do much missionary work among them. The same applies to particular classes of the community, such as those whose occupation necessitates meals at irregular hours and at short notice. Conversely, it might be found that particular classes do not at present use cookers, and these would be the ones to require to be worked, and presumably would be most amenable to judicious canvassing.

When the system of letting on hire was first introduced, it was in many cases distinctly understood that proper care for the appliance was a part of the bargain, and periodical inspection would have been accepted without question. But difficulties would probably arise if it was sought to introduce such a plan in any district where it has not hitherto been practised. At first, also, some rights were reserved as to refusal; but since appliances have become cheaper, there has been a tendency to relax these, and to supply any and every body. Unfortunately, it is just the worst cases of the kind above indicated—the dirty, the slovenly, and the indifferent—that would particularly object to being brought to book by the lady inspector in the case of systematic inspection, and who would also be the least likely to respond to an open invitation to attend at the gas offices or to receive the lady on their own ground. It might be urged that if any loss of business followed the insertion of a systematic inspection clause in the hiring agreement, such loss would be simply among those whose room is preferable to their company, and, directly and indirectly, are more plague than profit.

The Projected Gas Legislation for London.

The Bills relating to the gas supply of the Metropolis which have been promoted by the Joint Companies, the South Metropolitan Gas Company, and the London County Council, together with the South Suburban Gas Bill, and the Croydon Gas Bill, have been formed into a group (B), and will be referred to a Select Committee whose sittings will commence next week. The Battersea Borough Council have withdrawn their petition against the Joint Bill, and that of the South Metropolitan Company, and the Streets Committee of the Corporation of London have decided to generally support the Bill of the County Council, and to take such other steps as may be deemed advisable with a view to obtaining a larger reduction in the standard price of gas than the Council propose.

The Municipal Debt of London.—The Finance Committee of the London County Council have just prepared a return showing for the year 1903-4 the charge on the rates of each Metropolitan borough and parish, and the amount of loans outstanding for which each is liable in respect of loans for local and county purposes, together with the equivalent rate in the pound of the charge and the percentage of loans outstanding to rateable value. From the return, it appears that the total charge on the rates in respect of the debt of all the central and local authorities of London has increased from £3,399,362 in 1902-3 to £3,642,326 in 1903-4—an increase of £242,964, or 7·1 per cent. The average rate in the pound equivalent to this charge is 21·52d., as compared with 20·35d. in 1902-3. The total net debt outstanding has risen from £57,932,101 to £61,238,526—an increase of £3,306,425, or 5·7 per cent.; the debt for services not involving a charge on the rates has increased by 19·9 per cent. in the year; and the debt for all other services by 3·9 per cent. Of the total increase, £1,096,412 represents the growth of local debt and £2,210,013 the growth of the debt of central authorities. The percentage of debt outstanding to rateable value has increased from 144·51 to 150·75. The total amount provided for the repayment of debt in the year 1903-4 amounted to about £2,184,000; in the same period the net debt has shown an increase of £3,306,000; the total amount of new borrowings must therefore have amounted to at least a sum of £5,492,000.

FORMATION OF A WELSH GAS ASSOCIATION.

Meeting at Cardiff.

In accordance with the announcement made in the "JOURNAL" for the 21st ult. (p. 483), a meeting was held at the Park Hotel, Cardiff, last Wednesday, on the initiation of Mr. Octavius Thomas, for the purpose of considering the advisability of forming a Welsh Gas Association. There was a representative gathering; those present including: Messrs. D. Jones (Dowlais), Thomas Canning (Newport), D. W. Davies (New Tredegar), D. J. Davies (Hirwain), W. H. Morgan (Rhayader), R. J. Rankin (Ferndale), Charles White (Blaenavon), F. C. White (Treharris), T. H. White (Cwmbran), William Lester (Porthcawl), G. Mayne (Penrhwceiber), J. M. Small (Merthyr Vale), J. Mogford (Briton Ferry), W. P. Jones (Glyncorrwg), A. J. Bond (Aberavon), Octavius Thomas (Pentre), R. B. Silcox (Pontycymmer), Edward Jones (Pontypridd), and A. H. Brookman (Tenby). Letters or telegrams expressing sympathy with the proposal and regret at inability to attend were received from: Messrs. Henry Morley (Cardiff), E. A. Sainsbury (Holywell), J. W. Pennington (Colywn Bay), J. Hollings (Llanidloes), J. E. Hughes (Beaumaris), Thomas Davies (Llandudno), A. R. Cawley (Caerphilly), G. E. Woodford (Ruabon), J. Braithwaite (Wrexham), W. M. Ruxton (Carnarvon), S. J. Acland (Blaina), H. Jones (Pontardulais), J. E. Kenshole (Merthyr Tydfil), F. M. Harris (Barry), and A. Horace Brookman (Pembroke Dock).

At the outset of the proceedings, Mr. THOMAS CANNING was called to the chair.

The CHAIRMAN said that the first business was to consider whether it was advisable to form an Association of Gas Managers for Wales and Monmouthshire. For himself, he might say that this question had been broached previously on many occasions; but attempts to form such an Association in Wales had not been, from one cause or another, hitherto successful. That day, however, he saw before him a large and very representative gathering of gas engineers and managers, at least from South Wales and Monmouthshire. Where such Associations had been formed in other parts of the country, they had contributed, so far as he had been able to observe, to the great benefit of the members of the profession. They had stimulated the consideration of the many intricate questions associated with the manufacture of gas, and had also stimulated progress. An interchange of ideas upon such subjects as modern methods of working could not fail to be of utility. The districts in which such Associations had been formed had progressed more than had been the case in Wales. Looking at the proposal from this point of view, he thought it could only be productive of benefit. But there were other points which might be raised; and it would be only fair to hear all sides of the question.

Mr. CHARLES WHITE said he took it that the presence that afternoon of every gentleman was a tacit promise to become a member of such an Association; and he would remind them that success would depend upon the interest which each individual member would take in the Association. There were none of them too old to learn; and he never visited another gas-works without learning something—if only what to avoid. He was present himself with the intention of becoming a member. He moved a resolution to the effect that it was desirable to form an Association for Wales and Monmouthshire.

Mr. DAVID JONES seconded, and said he thought it would prove a great advantage to the managers and also to the shareholders of the various companies.

Mr. OCTAVIUS THOMAS thanked so many for having responded to his circular. He felt that North and South Wales were rather far apart, and that they would have to have some meetings in North Wales as well as in South Wales. He had had promises from over forty gentlemen; and nine of these were living in North Wales. He thought it better to mention this before anything was decided upon.

Mr. CHARLES WHITE agreed that if they expected North Walians to come South, sometimes they must themselves be prepared to go to meetings in the North. If they confined the Association to South Wales, they would cripple themselves at the start.

Mr. WILLIAM LESTER thought they were taking a very wide area in going to North Wales. He would like to know, as he was on his feet, why the Association had not been formed before.

The CHAIRMAN said that it was in the early days of the formation of District Associations that the proposals to which reference had been made were suggested. At that time, when inquiries were sent out, there were never received a sufficient number of replies to warrant them in forming an Association. Perhaps at that time the idea prevailed that such Associations were not advantageous to the profession locally and generally. Now, however, it was evident that a very different opinion was held.

Mr. W. H. MORGAN cordially endorsed the proposal, and expressed the view that such an Association should take the form of a National Instituton; for in Wales they still clung to the idea of the nation, and they had national characteristics in every sense of the word. Wales had certainly been behindhand. At last, however, they had awakened; and they recognized that such Associations as that which they were about to form were not only essential for the benefit of those interested in the manufacture of gas, but were also of very great benefit to those who invested their money in the gas companies, and also to the consumers.

He believed there was plenty of room for such an Association, and plenty of good material in Wales from which to make it. He would be happy to do anything he could to assist.

Mr. EDWARD JONES took it that all were agreed that such an Association should be formed. With regard to the benefits, those who like himself had had the pleasure of living in the North of England knew the advantages of these Associations. He had now been four years in Wales; and at the end of that time, he found himself in the position of knowing only three people at the meeting. He did not desire to interfere in any sense with the patriotism of those who lived in Wales; but he thought their interests would be the greatest good for the greatest number, and that most advantage must accrue if they made their Association so that it would include those living in the border counties just outside Wales. In England, they had Eastern, Northern and North-Eastern, Southern, and other districts, and why not have a Western district as well, and let it include Wales? If they merely confined the Association to Wales, he questioned whether they would have enough members from North Wales to justify its inclusion. Speaking of the benefits which would accrue from the formation of the Association, he said that South Wales had various monopolies which this institution would be able to break through for the benefit of the many.

It was pointed out that, though they might call the Association the Wales and Monmouthshire Association, there would be no objection to gas engineers and managers joining it who lived in the counties bordering on Wales.

Mr. CHARLES WHITE, after consultation with his seconder, altered his resolution to read: "That it is desirable to form an Association, and that it be called the 'Wales and Monmouthshire District Institution of Gas Engineers and Managers.'"

Mr. EDWARD JONES said he quite agreed to this.

The resolution, as amended, was then put and carried with acclamation.

The following were elected as the first office-bearers:—

President—Mr. Thomas Canning (Newport).
Vice-Presidents—Messrs. R. A. Browning (Neath) and Edward Jones (Pontypridd).
Committee—Messrs. T. Acland (Llanelly), J. Braithwaite (Wrexham), A. H. Brookman (Tenby), J. Gaunt (Aberystwyth), J. E. Kenshole (Merthyr Tydvil), and Charles White (Blaenavon).
Hon. Secretary—Mr. Octavius Thomas (Pentre).
Hon. Treasurer—Mr. H. Morley (Cardiff).

It was resolved that the annual subscription should be 10s. 6d.; and that half-yearly meetings should be held on the first Wednesday in September and March. A discussion followed as to the place of meeting in the autumn of this year, Sept. 6; Mr. Browning urging that it should be, in honour of their President, Newport. Mr. Canning, however, said that, while appreciating the suggestion, he felt strongly that Cardiff was the most central and accessible place; and in the interests of the Association, and with the object of getting as large and as representative an attendance as possible, it should be held there. In deference to this expression of opinion, it was resolved that the meeting should be held in Cardiff.

A vote of thanks to the Chairman closed the business meeting, after which the members partook of tea.

THE GAS INDUSTRY IN AMERICA.

At the Thirty-fifth Annual Meeting of the New England Association of Gas Engineers, held at Boston (Mass.) on the 15th and 16th ult., Colonel F. S. RICHARDSON (the President), in the course of his Inaugural Address, made the following remarks.

The general prosperity of the country, its remarkable commermercial advance, and the pleasing prospects for the future, have been shared by gas companies; giving many comforting anticipations, save in the few instances where untoward local conditions have conspired to rob the lighting company of a share of its business through no fault of their own. These are exceptions; but, unfortunately, they do exist. Let us hope news of good cheer may soon come to the owners and managers, whose courage and patience are being sorely tried at this time. No other business is more honestly conducted than ours; nor can there be found a more efficient and loyal class of people than the "gas men," notwithstanding the oft-expressed opinion to the contrary.

It would be a sin of omission were I to refran from repeating the advantage it is, and always has been, to claim membership in this mother of all Gas Associations in America. The renewed interest in its welfare, and the new faces with the old ones seen at these annual meetings, auger well for our continued growth and the good the Association can always do. Membership is not over large—the territory is rather small; but loyalty to each other's welfare and individual ability have always been a marked characteristic of this active coterie of industrious Yankees.

The increase in organizations throughout the United States—a healthy and fortunate circumstance for the members of our business—taken together with the many meetings now held over the period of each twelve months, imposes a task upon a President to produce an interesting, instructive, and original address. Such mentions as may be made in this, which will possess the one virtue of brevity, will be wholly from the standpoint of business view and experience.

A *résumé* of the valuable information contained in the last report of the Board of Gas and Electric Light Commissioners of this Commonwealth would be given at this time were it possible. The edition will soon be printed, and, like the earlier ones, will, without question, be found to contain very valuable information. It is the only publication of the kind in the country; and the artificial lighting business of America and elsewhere owes a debt of gratitude to the State of Massachusetts for the creation and maintenance of the Commission. It stands as a protector for the public, and is a safeguard to investors in artificial lighting properties. State supervision is, in my opinion, necessary for a relationship that is equitable, just, and right, to be attained and maintained between the public, the consumers, and the companies themselves. It is indeed to be regretted that other companies are not placed under like protection. Rigid supervision by the State, when governed by equitable laws, is the true solution of the municipal lighting craze, and as well the proper medium through which the operation of *quasi*-public corporations should be regulated.

To many, the present condition of the tar market is bringing a serious problem. Companies removed from Boston are put to a serious disadvantage on account of freight. The growing popularity of granolithic and cement sidewalks in towns and some smaller cities has eliminated a reliable and profitable outlet. Is it not possibie that our friends who furnish settings can produce a bench better adapted to the more perfect burning of tar, aided, perhaps, by an improved burner? The decreased revenue from the sale of residuals is sure to continue unless a change in present conditions occurs.

Those charged with the policy of conducting the affairs of a gas company, while not minimizing the importance of the operation and economies of the retort-house, are alive to the vital importance of finding and maintaining a market. The problem of putting many million feet of gas into the holders at a low cost per 1000 cubic feet is an easy task nowadays compared to selling that quantity at a fair price and having few dissatisfied customers. A most valuable asset in any organization is the man, or group of men, who go out to the inhabitants of the territory supplied, find an outlet for the product, and establish a good name for the local company. In the commercial world, it is easy to make goods; but the greatest successes are with those who report the largest profitable sales. Advertise and solicit your business upon proper lines; strive for the employment of an 18-hour daily output or the "level load" the electric light station so much desires, and the daily anxiety of the manufacturing end will be removed from those fractions of yield per pound and cost per 1000 cubic feet, and transferred to retort-house and holder capacity accompanied by a most gratifying increase in yearly profits and the fortunate opportunity of granting unsolicited reductions in selling prices.

Our friend—that household blessing—the gas-stove, is more in evidence than ever, and in greater demand each year. This feature of the gas business is no longer a novelty. It is like a coal pile; the works could not run without it. Far-seeing managers, while determining that every family shall enjoy its benefit, are active now in placing all gas appliances before the public. The play is just begun, nor do I believe the possibilities, future magnitude, or inestimable benefits of the gas industry to this country, when broadened by more perfect development, are at present adequately comprehended. A portion of these results rests in your hands.

Municipal lighting is ever present, and it can be assumed will be until other cities and towns have paid the price. In a spirit of fairness and curiosity, I would like one sound, honest reason, from a competent and intelligent advocate of this movement, why municipalities ought to embark in this particular venture. Surely it cannot be classed with water-works; for water is a bounteous gift from Nature, absolutely necessary to every living person. The advocates of municipal lighting are doing themselves great discredit, and the public at large a grave injustice, by overlooking the wonderful field of good to be done by public operation and ownership of those industries and interests upon which all living people are dependent for their daily life and comfort, providing any public ownership is desirable—a fact which I emphatically deny. If the public ownership of one business is desirable, why not of all? The information upon this subject acquired by a recent personal visit to Glasgow permits me to know and to state unqualifiedly that the movement is un-American, devoid of the advantages claimed, and fraught with grave menace to those who embark in its folly. Wise State supervision guarantees the fullest protection to the public; and it is a matter of surprise and amazement to those who are able to pass intelligent and unbiassed judgment that at this time its more universal adoption is being publicly and officially recommended. This injustice imposes an individual responsibility upon each one of us to fully and honestly inform those who are so uninformed and misinformed as to the real truth of so important a subject. Of all directions, that looking toward the assumption by municipalities of artificial lighting is the very last in which they should venture. The very nature of the business forbids; but the principle *per se* is wrong.

Careful and intelligent investigation, by those whose interests require or demand such conditions to be met, will, in my opinion, find great advantage, satisfaction, and profit in adopting high-pressure distribution. The problem has passed far beyond the

experimental stage. Its development is progressing along lines of improvement; and the possibilities are as yet but inadequately appreciated. It commends itself as solving economically questions of low pressures found at distant points from the works, eliminating large expenses for storage, and places smaller towns and the farming districts within city limits. It is the rural delivery of the gas business. There are mistakes to be avoided and many troubles to be met; but if the installation can be applied, and is properly made, the results are eminently satisfactory.

Perhaps the "Question-Box" and the session's discussion may furnish information upon, and show advance in, the ever-present and important subjects of high candle power street lighting; the rental of gas arcs, both indoor and outside; the expediency of caring for all mantle burners; whether all or a portion of needed mantles could be furnished free, as are incandescent lamps; the present state of inclined retorts; the best method of applying the art of advertising; new and novel methods to obtain new business; whether the two-meter system ought to be used; if "prepayments" are gaining in popularity; if anyone believes it probable, or possible, for a charging and drawing machine to be constructed and economically operated for use in works making (say) about 100 million cubic feet of gas per annum; the present state of the laws that govern electrolysis; and if naphthalene has, or can be, effectively removed. Surely they will elicit more valuable information than they would do were they presented through this address.

A brief reference is made to the proposition looking toward a consolidation of the various Gas Associations of America, or Federation so-called, which naturally would be one national body of gas engineers. Suitable action, through the proper and official medium, was taken at the Congress held in St. Louis last June. Without expressing any opinion upon the desirability of an action of this kind, save to declare that such a body would correspond to others whose members are men in the various professions, and valuable indeed to every line whose interests they represent, and with no suspicion of its being an official utterance—for the subject has never to my knowledge been discussed by this Association—I cannot refrain at this time and place from expressing the earnest desire that under no circumstances whatever will the members of the New England Association of Gas Engineers vote to seriously consider even the merging of our membership, or what would be more unfortunate, giving up this present organization.

Being the oldest Gas Association in America—the mother, in fact, of them all—unique in her position, rich in her memorable history, strong in her membership, ripe in her experience, and fortunate in her future prospects, I hope, should the occasion arise, each member will see that the present status of the organization is preserved. Undoubtedly much valuable work would be accomplished by federation, if properly concluded; but serious harm might be the result of one large society taking the place of all others now doing such commendable work throughout the Union. Even to the least interested it must appear that there are many pertinent reasons to warrant such a conclusion, were a careful deduction to be made from the premises in the case.

It seems to me that our profession—for such it is—warrants a special course at technical institutions, with a diploma and a conferred degree at graduation; for a gas engineer or an electrical engineer is as much of a reality to-day as those trained in other directions. He is filling as important and responsible a position in the world; and the places demand as much skill and as high degree of proficiency as do those dignified by an earned title from institutions of learning. In my opinion, a special course might, with good results, be adopted by one or more Institutions with such a worthy end in view.

The exhibition held at Earl's Court in London during November and December of last year marked an advance in our business and scored a great success. Much has already appeared in various gas publications that has proved a source of interest to you in its reading. The pleasure that was mine in attending was abridged in being unable to arrange to be present upon special dates; yet there was sufficient evidence given for the most casual observer to realize the good the undertaking must prove to the public, and the advantage it will be to the gas interests. American companies have not the favourable climate or weather for such continuous and universal use of gas as is found abroad; nor can we ever hope to equal the low cost of production, on account of pertinent reasons governing economic and physical conditions found there. But I think we may pause and take advice and courage to plan for a series of such exhibitions to be held in different parts of our country over a period of a few years. They could not fail of being of inestimable value, and with unerring certainty would enlist the co-operation of all manufacturers and suppliers of gas machinery and appliances. I seriously commend your earnest attention to this subject, as already most admirably treated by the Editors of some of the journals devoted to our interests.

The address closed with a few references to deceased members.

A report on mines and quarries for 1904 has been issued by the Home Office. It appears therefrom that in the United Kingdom in 1904 the output of coal was 232,411,784 tons, against 230,324,295 in the preceding year; fire-clay, 3,043,045 tons, against 3,066,835 tons; and oil shale, 2,333,062 tons compared with 2,009,602 tons. The total output of minerals was 245,775,315 tons last year, against 243,243,586 tons in 1903.

NORTHERN DISTRICT OF IRELAND GAS MANAGERS' ASSOCIATION.

The Disposal of Tar.

The First General Meeting of the Association was held last Tuesday, at Belfast, under the Presidency of Mr. W. H. ROBERTS, of Newtownards.

The PRESIDENT, after thanking the members for electing him to be the first President of the Association, said that it was gratifying to those who took an active part in forming the Association to see the large number of members on the roll; but there was still room for more. He then proceeded as follows: I need not say that it is our desire, as Managers in the Northern District of Ireland, that this Association shall be the means of bringing us into closer contact with one another, giving us an opportunity of exchanging our opinions and generally assisting us in clearing up the little difficulties which arise in the routine of gas manufacture. Also that the Association may be the means of still further strengthening the position of the Irish Association, which we are proud to say has been doing such an amount of good work in the profession. From the general remarks which were made at the first meeting, and with which I quite agree, reading of papers at the meetings of this Association will not be expected, but the general desire is that members shall bring forward any point they may wish to obtain information upon, or in other words "talk shop" in quite an informal manner. I think I am justified in saying that we ought to leave the reading of papers to be done by the Irish Association.

You will see that the principal subject to be before you to-day is "The Remunerative Disposal of Surplus Tar." Owing to the exceedingly low prices now received for our surplus tar—5s. to 7s. per 100 gallons less than a year ago—this subject ought to be of interest to every one of us. As there are various ways of disposing of this bye-product, I consider it is our duty to use every effort to find out the most remunerative means for its disposal, and I should be pleased if members to-day would express their opinions, giving their experiences and whatever method they are most conversant with.

The following are a few figures, &c., I have arranged to compare tar as a fuel as against coke in our producers. It must be borne in mind that the value of all classes of fuel in Ireland, with the exception of peat, is considerable higher than in either England or Scotland, owing to the heavy freight and carriage which it is necessary to pay to import it. Therefore tar is a fuel which must be valued at a higher price than it would be across the Channel, where coal is to be obtained at such a cheap rate. As this low price for tar has only affected me for a few months, I have not had time to thoroughly test tar as a fuel, but have based my calculations on figures taken from "Newbigging's Handbook," which I think I am safe to say can be relied upon. I find the average price received for coke in the North of Ireland is 4d. per bushel, and have based my calculations on that price. Quoting from "Newbigging's Handbook," we require 9¾ bushels of coke to carbonize 1 ton of coal. He also shows that we need 20 gallons of tar to carbonize the same quantity of coal. Assuming that these figures are correct, then 20 gallons of tar are equivalent to 9¾ bushels of coke. Therefore with coke at 4d. per bushel, or 3s. 3d. per ton carbonized, the value of 100 gallons of tar at the gas-works is 16s. 3d. Assuming that I am correct with these figures, I consider that we are making a great mistake selling our tar at the low price we are at present doing; and we ought to make thorough tests of their relative values. I should be pleased if managers would make a trial for themselves, and bring forward a statement of their results at our June meeting.

Before sitting down, I will read you two letters which our Secretary has received from tar distillers across the Channel. These firms are desirous of taking the whole product of the works of which the members are managers; and they think that in this way they would be able to give a better price for the tar than we are at present getting.

A discussion then took place, from which it appeared that the general opinion was to the effect that united action should be taken by the Association towards keeping up the price of tar to a fairly reasonable standard, as the market certainly did not warrant a reduction of nearly 50 per cent. below the rates current last year.

Mr. JAMES BRODIE (Omagh) moved "That the matter be remitted to the Committee, and that they move on lines suggested at the meeting."

Mr. T. FRIZELLE (Holywood) seconded the resolution; and it was adopted.

Subsequently the members proceeded to the gas-works, over which, through the kindness of Mr. James Stelfox, along with Mr. Sharp, the Assistant Manager, they were personally conducted. After an exceedingly interesting inspection, the President conveyed the thanks of the members to Mr. Stelfox and Mr. Sharp for their kindness in contributing so much to the success of the first general meeting of the Association. Mr. Stelfox suitably replied, and wished the members every success in their several spheres of work,

ROYAL SCOTTISH SOCIETY OF ARTS.

Communications by Mr. D. Macfie and Mr. H. O'Connor.

At the Seventh Meeting of the Royal Scottish Society of Arts in Edinburgh on Monday, the 27th ult.—Dr. Dawson Turner (the President) in the chair—the business was the hearing of communications upon gas appliances by Mr. D. Macfie and Mr. H. O'Connor, both of Messrs. James Milne and Son, Limited, of Edinburgh. All the appliances dealt with were shown by the Company at the exhibition at Earl's Court, and in that connection were referred to in the "Journal" for Nov. 22, 1904 (pp. 598-9).

A GAS METER AND GOVERNOR IN COMBINATION.

This subject was dealt with by Mr. Macfie. In the course of his remarks, he gave a description of the earliest methods of measuring and regulating gas—mentioning, among other appliances, the hydrostatic gas-regulator introduced by Mr. James Milne about seventy years ago, a specimen of which was on the table. As time passed, he said, the range of pressure had doubtless to be increased, because of the growing demand upon the mains; and when the employment of gas for heating and cooking by the bunsen flame came into vogue, an increase of pressure was absolutely necessary, and the old non-stuffed iron burner, as well as the delicate argand for lighting, gave place to a variety of contrivances to check the wasteful flow of gas because of the inevitable increase in pressure. The ultimate universal adoption of gas-meters, and the greatly lowered price of gas, helped, no doubt, to obscure the advantages of meter governors or regulators, and their use had never become general. Several causes might be

Macfie's Governor Meter.

assigned for this, as, for example, ignorance on the part of gas consumers as to questions of volume and pressure, and the widespread belief that all gas economizers should be placed in the same category as that impious fraud the expert, but now almost extinct, burner hawker, who by his wily patter could bedazzle the vision of the most wary gas consumer. The chief barrier to the general adoption of governors had been their first cost and the labour of fixing them in position. There was this further difficulty, that meter governors had not seldom been fitted in unfavourable positions, where the gas supply was deficient, either because of the meter being too small to give a free delivery of the volume of gas required at the adjusted pressure, or because of the gas-piping being insufficient, for the same reason. The problem of regulating the pressure in the mains—difficult everywhere—was specially so in Edinburgh, owing to its greatly varying levels; and nowhere had district governors been more widely distributed, nor to better purpose. But no system of district governors, useful and necessary as they were, could be entirely or equally effective at each consumer's meter, owing to the inequality of service-pipes in relation to the demand—that was to say, that to give sufficient supply to the weakest point involved delivery throughout some districts at a pressure much in excess of what was requisite or reasonable. The enormous waste in the use of gas, which went on largely unheeded, was a serious matter from the point of view of the proper utilization of a valuable product; and it was generally recognized that sellers of gas should realize their responsibility in this direction, if only on the ground of popularizing the use of gas, and enabling consumers to get value for their money. Within recent years, the necessity for some easy and universally applicable method of securing a sufficient but unvarying rate of pressure had become pressing; and the key to the situation might be found in the attachment to all meters of governors properly regulated to give an adequate, yet economical, supply at the measuring point. But the fixing of such governors as hitherto had been procurable was at once a clumsy and expensive method, and could not be faced by the suppliers of gas; nor, on the other hand, could consumers be expected to realize the advantages of such expenditure on their own behalf.

The "combined" meter and governor which was there exhibited had been devised with the view of providing a simple, compact, and economical governor, forming an integral part of the meter, so that gas might at all times be delivered to the consumer at such uniform pressure as his needs demanded. The governor meter had met with not a little approval on the part of gas engineers, and was already in successful operation in various parts of the country. The one shown was an ordinary 3-light dry-meter; and there was no alteration whatever in its measuring mechanism. The novel feature was that of a self-contained governor which formed an integral part of the meter. The governor was of the usual diaphragm type, with a cone valve so adjusted as to rise or fall according to the changes of pressure in the mains, when the governor was set to deliver gas at a given pressure. Any increase of the initial pressure raised and partially closed the governor valve, which, in fact, adjusted itself automatically, and delivered the gas on demand with no variation in the pressure as adjusted, whether the draw-off were great or small; its special claim to novelty (apart from the combination) being the means devised for the regulation of the pressure. This was accomplished by the adjustment of a ball-weighted lever; the weight being actuated by a tubular key which screwed the weight inwards or outwards on the lever, and gave a range of 1 inch for adjustment of pressure. The regulation of pressure by the use of the key was intended to be performed by an inspector with official knowledge of the necessities of each meter supply; but it might also be altered by the intelligent consumer. For present-day requirements, it was suggested that an outlet pressure of 10-10ths was the minimum at which gas might be anywhere delivered to the consumer, and that under no ordinary circumstances was a greater pressure than 20-10ths necessary, although a wasteful pressure of 40-10ths to 50-10ths was not unusual. The governor meter was arranged to reduce such excessive pressure, and to deliver gas at any pressure between 10-10ths and 20-10ths; the graduations on the key indicating the outlet pressure. In all cases where the pipes were large enough to convey sufficient volume to the various points of issue, a pressure of 15-10ths might be considered enough for all purposes; while pressure in excess of 20-10ths might (except for specially constructed fittings or apparatus) be deemed wasteful and extravagant. But, where required, the use of a heavier weight might be employed to deliver the gas at any higher pressure. The additional cost of meters fitted with the self-contained governor was only a few shillings on the ordinary sizes; and it might be suggested that a merely nominal charge such as this removed the only valid objection to the general adoption of meter governors on account of their first cost and the expense of fixing in position. The arrangement whereby a governor could be fitted within the compass of an ordinary meter case made it possible to have this type of governor applied to meters already in use. The ease and certainty of its regulation, and the use of a single unattachable weight, operated only by a special key graduated so as to show the outlet pressure at sight without the use of a pressure gauge, might be noted as features of the combination.

Mr. T. Hume remarked that dry meters were objected to by some because the leather portions of them became stiff, which affected the registering of the gas. He feared the leather of this diaphragm might become troublesome. But there could be no question about the advantage of having the governor attached to gas-meters.

Mr. T. Proctor asked what was the age limit of gas-meters. This invention was something new. They had had mercurial governors, in which he did not see much advantage; but this one appeared to be very simple.

Mr. D. W. Kemp said he could not understand how the gas bills at his works were every quarter getting bigger; but Mr. Macfie had explained it. He thought that there was a call for apparatus of the kind shown.

Mr. Proctor asked if the invention could be applied to wet meters.

Mr. Macfie said it could not. Dry meters were in use for five, ten, or twenty years. The life of a dry meter was less than that of a wet meter. There were some wet meters which had been in use for seventy years. No one could ever hope to have a more exact measuring instrument than a wet meter; but there was a great deal of exaggeration as to the "lying" properties of dry meters. The present was not the first application of the diaphragm governor; the novelty in the one shown was that it was within the meter. He thought the public must make up their minds for an increase of pressure, because incandescent fittings were becoming so common, and then governors would be required. All he argued for was that there should be unvarying pressure, and that each gas-meter should be so governed that the pressure would be equal Sunday and Saturday, day and night.

A FLASH-LIGHTER FOR INCANDESCENT STREET-LANTERNS.

Mr. O'Connor gave the following description of his invention for the lighting of street-lamps fitted with incandescent burners:

Gas turned on to mantle and flash light, which protrudes through frame of lantern.

Flash light passing over mantle.

MILNE'S PATENT INCANDESCENT FLASH LIGHTER.

The ordinary lamp-cock is replaced by two cocks in one; that nearest the upright pipe serving to turn the gas on and off to the burner proper, the other being placed in the plug in a direct line with the inside of one of the astragals, and being capable of supplying the flash-light. The plug of the first cock has an inlet and outlet at different levels on the same side, and a groove in the plug which, when opposite the inlet and outlet, permits the gas to pass up to the burner proper. There is also a hole through the plug at the level of the inlet opening, which allows of the passage of the gas to the second or outer cock at the same time as the supply is given to the burner. The plug of the outer cock has an inlet at one side and an outlet on top axial with it. Into this outlet is fixed a tube of small diameter, which passes through the bottom of the lantern and up inside the astragal to the top, where it is bent at right angles, and has its end bent again, so that it may pass through the side of the top horizontal astragal. At the end of this bent tube is a single-jet burner, pointing directly downwards; the length of the bent portion of the tube being just sufficient to reach to the centre of the lantern. As this tube is fixed to the plug of the cock, it is evident that when the plug is turned, the bent arm will be turned also. It is so fixed that when the plug is moved so that the gas can pass up the tube, the bent arm is protruding through the astragal of the lantern, and the gas can then be lighted; while, when the arm has been turned backwards a quarter of a circle, the bent arm has been carried into the lantern over the burner proper, and then farther backwards until it rests against the other side of the lantern, by which time the whole of the plug is completely shut off from the inlet, and the single flash-jet is extinguished. By the arrangement of single cams on the two plugs, the turning of the plug on the flash-light cock also opens the passage-way on the supply-cock to the burner proper, so that gas is free to pass to both burners, and when the flash-light is turned across the lantern, and then out, by the lever as its plug, the cam on the main supply-cock is left, and the gas passes to the burner until the lever on this latter cock is also turned back, when both the lights are extinguished. The operation by the lamplighter is very simple. When he wishes to light up, he turns on the flash-light cock, and so opens both, lights up the flash-light outside the lantern, and then turns out the flash-light cock. When he wishes to extinguish the light, he turns off the lever on the main supply-cock. The fact that the flash-light only burns for the fraction of a second makes the size of the flame a matter of little importance; while the shape of a single-jet flame renders it very difficult to extinguish by wind. A small tube in the hole in the astragal prevents the possibility of the glasses blackening. The cost of the apparatus is very low, more especially when it is considered that it takes the place of the ordinary lamp-cock.

The PRESIDENT asked if it was possible to turn incandescent gas-lights partly down.

Mr. PROCTOR thought that the invention was most distinctly an improvement all round. It would enable lamps to be lighted without smoking the reflector.

Mr. O'CONNOR replied that it was practically an impossibility to turn down incandescent gas-lights; they must be either full on or off. Some of the public lamps in Edinburgh had been fitted with the appliance shown, and they were giving satisfaction. They had been placed in positions where there were very severe winds, and there had been no trouble through blowing out.

A TEST FOR CARBONIC ACID AND OTHER GASES.

Upon this subject Mr. O'Connor said: For the determination of the various gases in gas-producers and the flues of furnaces, whether used for heating gas-retorts, coke-ovens, or boilers, there have been many forms of apparatus suggested, all more or less elaborate, and requiring a course of education in the manipulation of chemical apparatus. This education has not been included in the training of many of the men who have charge of such furnaces. I therefore tried to devise some simple form of apparatus which would serve as an indicator of the portion of the gases which principally governs the good or bad heating of such furnaces. From elaborate tests made of the various gases in the flues of such furnaces, we find that they should consist of 16·6 per cent. of carbon dioxide (CO_2). If, then, we have a means of ascertaining the percentage of this gas, we can reduce the pull until we find that we have just a certain percentage of it, and no more. To test such gases, we must first provide ourselves with an aspirator to withdraw them from the flue; and then we may treat them in several ways to obtain the carbon dioxide. We may absorb this gas in a solution of caustic potash or lime, and note the reduction in the volume of the gas after we have readjusted the pressure; or we may, on the principle laid down by Mr. Vernon Harcourt, cause the gas to be passed through lime water, until the latter assumes a similar milkiness to a coloured liquid provided. Or, again, we may pass the gases through an alkaline solution, and then titrate the solution, coloured with phenol (phthalin), with an acid of known strength, so as to obtain the quantity of the alkali neutralized by the carbonic acid. It is a modification of these last two methods that I have devised. I provide an aspiration by means of the up-stroke of the pump drawing in through a side inlet to the barrel a known quantity of the gases, and then by the down-stroke the valve on the side inlet of the barrel is closed, and this quantity of gas is forced through a measured quantity of the liquid in the glass below the pump. This liquid may be, first, a saturated solution of lime water, made by putting an excess of caustic lime into water at 60° Fahr., allowing it to dissolve, and thus decanting the clear liquid, which, when a sufficient quantity of carbon dioxide has passed through, will be converted from CaO to $CaCO_3$, with the familiar milky appearance. The extent to which this milkiness should be carried, I propose should be fixed by the opacity of the liquid, rather than by its adopting any definite colour, as in the Harcourt colour test, because this latter method requires the employment of a second glass vessel of equal diameter, with a definitely coloured liquid inside it. I therefore arrange that the pumping should be continued until the opacity of the liquid shall hide the definition of the centre or delivery take of the pump, which will always occur when an exact quantity of $CaCO_3$ has been made by the pumping of the gases through the liquid. The capacity of the pump being known, and being kept constant by the spring drawing up the plunger a regular height with each stroke, we have only to regulate the quantity of lime water through which the gases have to pass to obtain the quantity of the gas containing the required quantity of carbon dioxide to bring about the necessary opacity. I have, by experiment, fixed the proportionate quantities; and each test is marked for the necessary quantity of lime water, so that the number of pumpings divided into 200 gives the required percentage of carbon dioxide in the gases. An alternative method is to fill the glass vessel with a quantity of alkaline solution coloured with phenol (phthalin), and to operate as before until the colour is taken out by the neutralization of the solution, owing to the acid nature of the carbon dioxide. This gives a very sharply defined indication. As the quantity of carbon dioxide is not a large one, only a weak solution of the alkali is required, amounting to about 1-500th normal, or N/500. The apparatus is of most value when used to regulate the quantity of air drawn in for primary and secondary combustion in gaseous or regenerative furnaces which are now becoming so common wherever such heats as 2000° Fahr. and upwards are required. These are now almost universal in gas-works, and very large numbers of furnaces, amounting in the most important works to nearly 1000, are in almost constant use. Here in the gases of the producer we should not have more than 5 per cent. of carbon dioxide for good working, and some 21 per cent. after the admission of the heated secondary air and complete combustion. If, then, we have a ready means, such as this, for finding out the quantity of this compound, we can regulate the admission to that most suitable for economical fuel consumption. It is evident that this apparatus can be used to obtain the quantity of other gases absorbable by different reagents, such as sulphuretted hydrogen, by a lead solution, which it turns brown, and ammonia by a sulphuric acid solution coloured with methyl orange.

The PRESIDENT said it had long been a *desideratum* to have an instrument to register, as easily as a thermometer indicated temperature, the proportion of carbon dioxide. The instrument before them more nearly fulfilled this purpose than anything he had ever heard of. What they required was an instrument of sufficient delicateness to give rapid and accurate determinations of the presence of carbon dioxide in varying conditions, because the pollution of the atmosphere was very important, as regarded health. It seemed that carbon dioxide was probably the main cause of the headaches to which people became subject when attending places where crowds were assembled; and they took carbon dioxide also as an index of the pollution of the air by other agents, such as microbes and organic matter.

SCOTTISH JUNIOR GAS ASSOCIATION.

Visit of the Eastern District to Peebles New Gas-Works.

On Saturday, the Scottish Junior Gas Association—Eastern District—paid a visit to the new Corporation gas-works at Peebles. About forty members attended. They were met at the works by Mr. Alex. Bell, jun., the Manager, and Mr. W. H. Williamson, the Treasurer to the Gas Commissioners. Mr. Bell conducted the party over the works, giving explanations as he went along. It is anticipated that the works will be ready for making gas in little more than a month. They were expected to have been completed by this time; but unforeseen difficulties arose, which have led to their being still in the hands of the contractors. The retort-house is all but ready for work, and so are the condensers, the exhauster, purifiers, gasholder, station meter, and the governor; and a new main has been laid to the town of Peebles—over a mile away. The washer, which is to be of the Young pattern, is still to be erected; the foundation for it having only been laid. There has been expended on the works about £20,000, of which £7000 represents work such as roads, fencing, and draining, which will be non-revenue producing. The new works are situated in a very charming landscape, close by the River Tweed, and alongside the North British Railway Company's line between Peebles and Galashiels. The site is triangular in shape; and woods upon two sides of the triangle very largely conceal them from view. The inspection over, tea, provided by the Town Council of Peebles, was served in the offices, after which

Mr. A. MASTERTON, the President of the District, said it would be not only unbecoming but ungrateful if they left this lovely district without acknowledging their indebtedness to their entertainers. They had to thank the Corporation of Peebles for the privilege they had been granted to inspect their works; and they could not thank Mr. Bell and Mr. Williamson too much for the trouble and time they had expended to make their visit an enjoyable one in all respects. They had seen a model small gas-works, perfect in every detail, designed by Mr. Bell, and erected under his supervision.

Mr. WILLIAMSON said it was with great pleasure that they heard from Mr. Bell, their Manager, that the Association proposed to visit Peebles. They took it as a compliment that they should have visited their works, and as a very special compliment to their Manager. He was sure that in their community there was not one who was held in higher regard and esteem than Mr. Bell. When the gas-works were taken over, they were assured by competent authorities that the retort-bench was capable of manufacturing 16 million cubic feet of gas a year, and that the piping was capable of passing about 20 million cubic feet; but the increase in consumption had been so great that they had now got up to nearly 30 million cubic feet a year. This had been done in the old works; and it seemed as if, in Mr. Bell's hands, they had become so elastic that new works were unnecessary. The Corporation had every confidence in their Manager. Everything had been entrusted to him. Since the gas undertaking was acquired, the price of gas had been twice reduced. It was now 3s. 2d. per 1000 cubic feet; and they did not expect that the greatly increased expenditure upon the new works would require them to increase the price, but rather that, in a few years, they would be able to reduce it.

Mr. BELL thanked the President for what he had said of him, and the company for the hearty way in which they had received his remarks. He was sorry that the works were not in a more advanced state before they came there; but that could not be helped. He would be very glad to see them all back again.

Mr. WILLIAMSON expressed the pleasure they had in having Mr. A. Bell, sen., of Dalkeith, present.

Mr. BELL, in returning thanks for the recognition of him, said the Corporation of Peebles had done more for the town during t e past ten years than had been done for 100 years before; and in the erection of these new works they had shown their confidence in the future of the gas industry.

This closed the proceedings at the works, and the party returned to Peebles.

CARRYING TAR AND LIQUOR BY RAIL.

In the "JOURNAL" for the 14th ult. (p. 425) reference was made to a short paper on the above subject read by Mr. F. J. R. CARULLA to the Nottingham Section of the Society of Chemical Industry. The following is the text of the paper, as given in the current number of the Society's "Journal."

There are four interests involved in the construction of a railway tank-waggon: (1) That of the railway company; (2) that of the gas company selling the tar and liquor; (3) that of the maker of the waggon; and (4) that of the chemical manufacturer or owner of the waggon. The first three interests are so powerful that the owner is practically effaced as regards the construction of the vehicle.

The railway company over whose line the waggon has to travel are concerned with the proper construction of the under-carriage, and that the tank shall be strong enough to carry a quantity not exceeding 10 tons of tar or liquor—being quite indifferent as to the shape of the tank. For some not very obvious reason, railway companies object to tanks of larger capacity than 10 tons.

The gas company selling the tar and liquor really decide the shape of the tank. To meet their convenience, the shape may have to be that of a parallelogram instead of the possibly more economical, and certainly stronger, form of a cylinder. Small gas-works inconveniently situated frequently send their liquid residuals to be loaded in petroleum barrels, which are lifted to the top of the railway tank and emptied into it. In this case the roof of the tank has to serve as a floor on which the barrels are rolled, so that the flat form becomes indispensable.

The maker of the tank naturally gives the lightest structure consistent with the requirements of the railway company; and the owner or chemical manufacturer will feel quite satisfied that he has done his best by getting the cheapest tank that the railway company will pass. Now, the railway company are not concerned with the construction of the tank itself, although they carefully examine the tank. Steel plates are very strong, even when thin, and a tank made from ¼-inch plates will last many years without leaking. A time is sure to come, however, when the tank begins to give trouble on account of its construction; and it is then that the chemical manufacturer or owner awakes to his real interest in the matter. Any loss through leakage he has to pay for; and the railway company immediately ask the owner to have the tank repaired. The maker of the waggon patches up the tank, and thus gives it a further lease of life.

What the cause for the necessity of such a repair in a flat tank may be was most instructively illustrated not long ago by one which leaked in several places at the bottom, and, on examination, was found to require renewal practically all round the seating. The plates forming the bottom of the tank were taken out, and some 9 or 10 inches sheared off all round, and narrow plates riveted on, forming a frame for the middle of the old bottom, which was quite sound and almost of the original thickness everywhere except at the edges.

How this came about will readily be understood from the fact that the iron or steel bottom of a flat tank rests on the wooden frame of the waggon body; and, however strongly stayed together the two portions of the combined structure may be, a certain amount of abrasion is constantly going on whenever the waggon is in motion, which rubs off any protective coating in contact with the wood, exposing the metal to oxidation. The rust thus formed becomes embedded in the wood, which, when the vehicle is in motion, acts as an emery stick, so that, in the case referred to, through this action the bottom of the tank was in many places not more than 1-16th inch thick at the edges.

The object of the present note is to suggest to chemical manufacturers that, when ordering new tank-waggons, they should specify the addition of what may be called an abrasion strip to be riveted to the tank, to take up this wear, in all the places in which the plates come in contact with wood, and to be attached in such a manner that, when worn out, such strips may be easily renewed. The owner will then find that, at the cost of a few shillings, he has nearly doubled the life of the tank.

In the discussion upon the paper, Mr. J. F. Kempson said Mr. Carulla's method might prevent a certain amount of wear at the angle of the tank; but he doubted whether it would be of any very great value. A flat-bottomed tank, settled down on a good wooden framework, lasted a long time. He had had one or two tanks running for considerably more than sixteen years, and they were not bad ones yet. He detailed a form of setting for flat tanks which they had found satisfactory. At each end of the tank a strong baulk is placed on edge, going from one side to the other of the waggon frame, to which the two baulks are securely fastened. The frame and these baulks across it form a cradle to hold the tank in its place; and, with tie-rods of proper strength, there is very little of the wear referred to in the paper. Mr. Carulla approved of the form of setting described, but thought that even in this case the abrasion strips he had advocated would be an improvement.

Gas for Railway Station Lighting at Adelaide (S.A.).

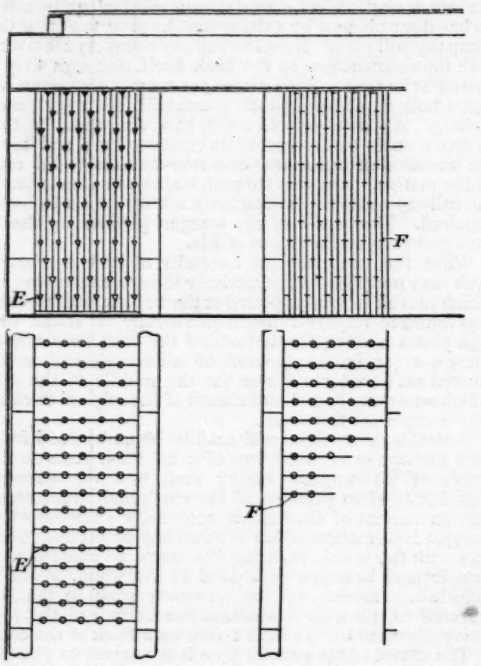
After being lighted by electricity for more than four years, the new railway station at Adelaide, South Australia, is now being lit by gas; the Government having entered into a contract with the Gas Company under which they have fitted up the station with lamps, pipes, &c., and will supply gas for ten years from February, 1905, at the end of which term the lamps and pipes will be the property of the Government. It will be remembered that in February last year there appeared in the "JOURNAL" an article on "The Banishment of the Electric Light" from the Victoria Terminus. The Secretary of the South Australian Gas Company showed it to the railway authorities at Adelaide, who said that if he had any suggestions to offer regarding a similar arrangement and saving at their station they would be obliged for such a communication. The Gas Company then submitted a scheme for lighting the station by gas; and the Railway Department called for tenders for both gas and electricity. The Gas Company's tender, which was much lower than the Electric Light Company's offer, was accepted. Upwards of 400 burners have been fixed, giving 57,200-candle power. The station is a large one, and cost about £100,000 to build.

REGISTER OF PATENTS.

Grids for Gas-Purifiers.—Cutler, S., and G. B., & S., jun. (S. Cutler and Son), of Millwall, E. No. 5395; March 4, 1904.

Patents No. 19,644 of 1902 and No. 14,970 of 1903 were for "the use of a grating-like device for supporting purifying material in gas-purifiers;" and the present invention relates to certain alternative methods of supporting the purifying material, and which methods may in some cases be used instead of, in addition to, or in combination with, the devices described in the earlier patents.

In one arrangement, instead of the grating bars a series of inverted cones or pyramids are used, superimposed upon or above each other, or alternatively suspended upon rods, chains, or wires.



The illustration is a sectional elevation and a part plan of a purifier fitted according to the invention; the left-hand portion being fitted with cones or pyramids E, and the right-hand portion with discs F suspended by chains or wires.

In some cases the chains, wires, or rods are placed horizontally, instead of vertically; and in such alternative arrangement they may be used either with or without the pyramids, cones, or discs.

In another arrangement the patentees use a series of discs placed at vertical intervals upon rods, chains, or wires. Where bars are used for the gratings, they may be made of square, rectangular, circular, semi-circular, segmental, polygonal, or irregular section instead of the triangular section usually adopted.

The bars and other parts of the gratings, cones, or pyramids may be of wood in its natural condition, or coated, creosoted, pickled, or rendered fireproof. Also they may alternatively be formed partly or wholly of plain or galvanized or coated metal, or of cement formed either with or without a metal core; or, again, they may be made of glazed or unglazed pottery ware.

Charger for Gas-Retorts.—Toogood, H. J. No. 6882; March 22, 1904.

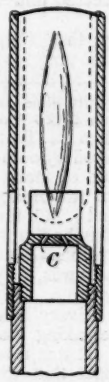
This patent relates to a machine for the charging of gas-retorts, which was described and fully illustrated in the "JOURNAL" for Nov. 22, p. 608. The apparatus is of the projector type; and the principal object of the invention is to pass the coal through the machine more steadily, and with less breaking and grinding of it. By this means, it is claimed that an economy in the power acquired to drive the machine is effected, and also less dust is caused, whereby the coal is more fully utilized for the production of gas and coke. The coal is received into a groove or track merging into a delivery aperture, along which a series of push or sling plates, or receptacles, travel at varying speeds, gradually accelerating the travel of the coal as it approaches the delivery aperture; the accelerated speed being imparted to the push-plates or the like by the combination of two circular motions, or by a series of rollers running at different speeds, or other suitable arrangement.

The power to drive the machine may be obtained from any convenient source; and a belt or chain in connection with the motor imparts a rotary motion to a drum, within which are a number of blades, push-plates, or sling-plates, adapted to run loosely upon a mandrel as a centre—the said mandrel being below the axis of rotation of the drum. Each of these blades passes through a slot in a bar; the bars filling slots or openings in the drum, in which openings the bars are adapted to turn as required by the movements of the blades, which are, of course, eccentric in relation to the drum. The drum may be provided with a central stud or short shaft at one end, a pulley or wheel thereon receiving the drive from the motor to rotate the drum; or the rotation may be effected by a sprocket-wheel driven from the motor. The drum is preferably open at both ends, and may be retained in position by means of three guide-pulleys or bowls; the studs on which these pulleys run being supported by arms secured to the framework or casing of the machine.

The coal being fed in by gravity from a hopper or shoot, falls upon the drum, the parts of which between the bars are concave in order to increase their carrying capacity. The drum rotates, carrying with it the blades, which act as push-plates or slings for the coal; but while the outer edge of each blade when at or near the feeding end of the machine is but a short distance from the centre of movement of the drum, and therefore begins acting on the coal slowly and steadily, when the same blade approaches the discharging end, its extremity is working at a much greater distance from the centre, and is therefore travelling at a much higher speed (say, five times as fast), so that such blade acts after the manner of a sling, and shovels or projects the coal at a high velocity into the retort. Below, and in front of, the feeding opening may be provided means for directing the falling coal on to the drum—such as an adjustable slide, or a hinged directing plate having a quadrant or tail-piece perforated with holes for the insertion of a set-screw, by which means the angle of the plate can be regulated. A weighted flap is so arranged that, if a large piece of coal should enter the machine, it will raise the flap and also the hinged inspection-door, and fall out at the back of the machine, thus obviating any risk of bending the blades. A baffle-plate may be employed to reduce the delivery opening and give an upward tendency to the stream of coal ejected, the raising of which baffle-plate may be accomplished by means of a screw. Suitable means may also be provided for raising, lowering, or inclining the delivery opening, controlling the speed, and traversing the machine. The patentee adds that, "as this apparatus avoids the great waste of power which is unavoidable in a centrifugal turbine charging machine, it need only be driven at a moderate speed—say, of 80 revolutions per minute—and very little power is required to drive it, since there is only one blade moving at a high velocity at any given moment."

Bunsen Burners.—Imray, O., a communication from Julius Pintsch, of Berlin. No. 7145; March 24, 1904.

This bunsen burner is constructed with the channels through which the gas enters the burner-tube arranged so as to converge at a certain angle towards each other, by which means "the fine streams of gas are made to impinge upon each other immediately upon entering the burner-tube, and thereby to at once thoroughly mix with the incoming air." In this way the bunsen tube for incandescence burners "can be considerably shortened or reduced in height."



The patentee remarks that in the bunsen burners of present construction—with single-hole or five-hole gas-nipples, and in particular those in which the gas enters at considerable pressure—the arrangement of the channels in the gas-nipples is such that the issuing streams of gas are brought so late into contact with each other that the mixture of the gas with the air in the bunsen tube is very imperfect. Consequently when using a comparatively short bunsen tube, the flame burns as an illuminating flame above the wire gauze, and mostly only in the middle of it. By the "improved arrangement" of the channels of the gas-nipple, the impinging of the gas streams upon each other immediately after their issue effects, even in a short bunsen tube, "so advantageous a mixture of the gas and air supply that a uniformly distributed non-luminous flame is produced above the wire gauze of the burner-head, which flame, in consequence of the resulting more perfect combustion of the air and gas mixture, brings the entire mantle to a perfect state of incandescence, whereby any deposit of soot thereon is effectually prevented, even when employing heavy gases."

The angle at which the channels of the gas-nipple must converge towards each other must be in such relation to the length and diameter of the bunsen tube that the broad jet of gas produced by the impinging of the gas streams upon each other does not materially come in contact with the sides of the tube, so as to prevent friction and consequent loss of pressure and diminution of light.

According to one arrangement for carrying out the invention, the gas-nipple is made with two opposite channels which may converge towards each other at an angle of from 70° to 80° as shown. Here the bunsen tube is made considerably shorter than the bunsen tubes of ordinary construction, and the usual restriction is dispensed with. The small gas-jets issuing from the channels C being made to impinge upon each other at a short distance above the nozzle, the gas becomes spread out as indicated in the dotted lines; this being the form of the jet in the direction at right angles to the drawing. By this means, the gas rapidly becomes intimately mixed with the necessary proportion of air entering through the lateral openings; so that, although the wire gauze cap is a comparatively short distance above the gas-nozzle, the gaseous mixture issuing through it "will be so perfect as to produce a very hot bunsen flame.

Incandescent Mantles of Quartz Filaments.—Wien, H., and Mintz, R., of Vienna. No. 7668; March 31, 1904.

The patentees remark that "it is well known that incandescence mantles for gas and like illuminants, prepared as at present by impregnating woven, crocheted, or knitted vegetable fibre with the salts of the luminous rare earths, are very fragile; and on account of this defect numerous attempts have already been made to produce mantles partly or wholly composed of mineral fibres, such as asbestos or glass threads, though without any perfectly satisfactory result, owing to the mineral substances used being either unable to withstand the heat or to their diminishing the illuminating power of the absorbed rare earths." This difficulty they propose to obviate by the production of mantles in which the vegetable fibres are wholly or in part replaced by quartz filaments, which have, they say, "compared with other mineral filaments hitherto used for the same purpose, the great advantage of

uniting in themselves the necessary qualities of transparency and resistance to fusion."

For the purpose of manufacturing these quartz filaments, pure quartz is fused, preferably in the electric arc furnace, and a filament drawn from the molten mass in the same manner as in glass spinning, and wound automatically on a rapidly revolving reel or drum. The thickness of the quartz filament is determined by the temperature of the molten or softened mass of quartz; finer filaments being obtained at higher temperatures, and coarser ones at lower temperatures. The too rapid cooling of the quartz filament is prevented by heating the revolving drum in any suitable manner, and then allowing the same to cool slowly after all the filament has been wound, which enables it to fully retain its suppleness and elasticity, when the filament can be manufactured in the usual manner into a woven, knitted, or crocheted foundation or carrier for the luminous earths to form an incandescent mantle.

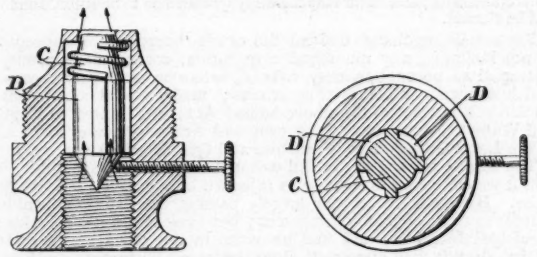
To increase the absorptive power of the mantle for the rare earths or the usual salts—such as thorium nitrate or cerium nitrate—the mantle may be manufactured of a mixture of quartz filaments and vegetable fibres. In such cases, the unimpregnated mantle is dipped in the usual way into a solution of the rare earths to be used—such, for instance, as a solution of thorium nitrate containing ceria—and treated further in the ordinary manner, or moulded in the blowpipe flame. Mantles made of the quartz filaments alone must be dipped for a long time in a supersaturated solution of the rare earths, so that the particles of thorium and cerium, or the like compounds, may adhere or crystallize directly on the quartz fabric.

The adhesion of the crystallized salts of thorium and cerium or the like to the quartz fabric of the mantle can also be effected by means of suitable mineral or organic cements. The mineral cements best adapted for this purpose are readily flexible salts, such as alkali carbonates, borates, or the like; while of organic cements, solutions of dextrine or the like may be used, which, when burnt off, are volatilized completely, and leave the particles of the rare earths evenly distributed on the quartz fabric.

Gas Regulating Valve for Bunsen Burners.—Weickart, T. H. W., of Leipzig, Germany. No. 8213; April 9, 1904.

This apparatus for regulating the supply of gas to bunsen burners consists in a valve normally pressed open by a spring, the shank of which has grooves for the passage of the gas and a conical or like end against which a thumb-screw operates, so as to enable the valve to be more or less closed as desired—the object of the invention being to enable a fine adjustment to be attained.

The upper end of the valve-chamber—*i.e.*, the end which enters the mixing-chamber of a bunsen burner—has a conical valve seating; and within the chamber a valve C is adapted to close on the seating. The shank of the valve has longitudinal wings or ribs to act as guides to the valve; the spaces D between the ribs permitting the passage of the



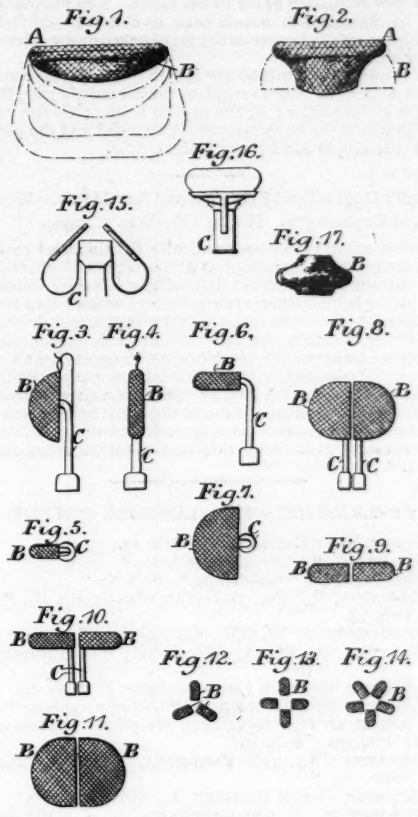
gas. Between the valve and the valve seating is a spiral spring, which tends to push away or open the valve. The lower end of the valve-spindle is conical, and passing through the wall of the valve chamber is a screw the inner end of which is in contact with the cone. The arrangement is such that if screwed up, it will act on the cone and raise the valve against the action of the spring towards the valve seating—thus diminishing, or even cutting off entirely, the flow of gas to the mixing-chamber; while on unscrewing it, the spring pushes back or opens the valve to a relative extent, and allows a greater flow of gas to the mixing-chamber.

Incandescent Mantles.—Nusch, F.; a communication from Georges Mortimer-Sterling, of Paris. No. 24,694; Nov. 14, 1904.

This invention relates to an altogether altered form of mantles, concerning which the patentee says: Since the incandescent light mantles of any system have been in use, the most adopted form has been that of a cone. Obviously, the incandescence of the oxides of these mantles is only produced inside the lower part of their body, and a greater part of the rays produced when in use are not reflected to the ground. In practice, the mantles are limited to certain dimensions; so that, in order to get a light of great intensity, a number of them have to be put in one lamp. Another inconvenience accrues to mantles of known type in that they are open at their base, so that they can only be fixed to their supports at a very small point of their top end, which makes them very fragile, and the smallest shock causes a breaking of them.

Various forms and attachments of the new mantles are shown. To a support A in the form of an oval, a double folded tissue is fixed around the edge of it, and various forms may now be adopted for the surface of the mantle B. Thus, the mantle may have the shapes as shown in full and in dotted lines in figs. 1 and 2; and they may be fixed either vertically as shown (in elevation, side view, and plan) in figs. 3, 4, and 5, or horizontally as (elevation and plan) in figs. 6 and 7.

Two of the incandescent light mantles may be combined in one lamp and fed from two burners, which will give a considerable light surface, and they may be disposed either vertically as in figs. 8 and 9 (elevation and plan), or horizontally as in figs. 10 and 11. A larger number than two may be assembled, as is shown in figs. 12, 13, and 14. But,



apparently, the most adopted form of burner C—especially when more of them are assembled in a single lamp—is the flattened semi-circular one "giving best results in lighting and requiring the least space."

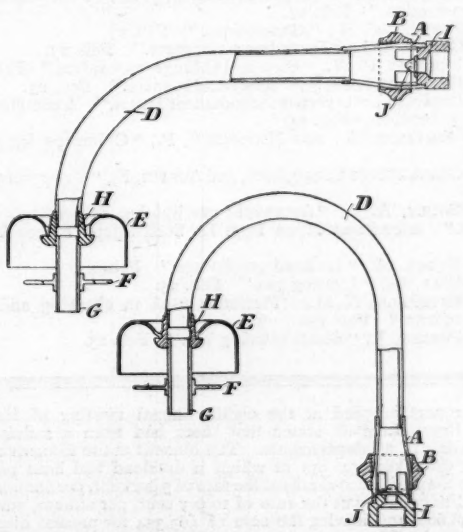
The flame for lighting the mantles will be in certain cases round, in others flat; the latter being produced by a fish-tail burner, or by two inclined screens, as shown in figs. 15 and 16.

The tissue of the mantle may be doubled, "which gives a great resistance," for which purpose also the lower end of the mantle may be bent over; or the tissue may be substituted by small bars, placed between the two cones of the flame, and the supports may be of any suitable material, and the heat produced by the burner may be applied to heat the air supply of the mantle.

Fig. 17 shows another modification of a mantle, obtained by flattening a cylindric incandescent light mantle by pressure acting in the vertical direction. Such mantle presents by itself two large horizontal light-surfaces similarly as this is attained by two mantles shown, for instance, in fig. 10.

Burner-Tubes for Inverted Mantles.—Helps, G., of Nuneaton. No. 12,403; June 1, 1904.

The patentee's claim is: "In bunsen burners for inverted mantles, a burner-tube bent or curved in such a manner as to prevent the products of combustion interfering with the proper supply of air to the



air-chamber—the nipple not being in a line with the burner-head." Such burner-tubes may be used in several forms without risk of the burner firing-back; the air-chamber being kept at such a distance from the burner-head that the hot products of combustion cannot interfere

with the proper admission of air to the tubes. Any number of burner-tubes may be connected to one air cone or chamber—each having its own gas-nipple; or the burner-tubes may be separate and have separate air cones or chambers.

Two forms of the burner-tube are shown. A is the air cone or chamber; B, the adjustable ring to regulate the air supply; D, the burner-tube; E, the globe holder; F, the mantle holder; G, the nozzle; H, the socket to which the burner-nozzle is attached and the globe holder secured; I, the nipple block; and J, the nipple.

Automatically Lighting and Extinguishing Gas-Lights.—Wildschiodtz, C. C., of Copenhagen. No. 29,416; Dec. 31, 1904.

Clockwork mechanism for automatically lighting and extinguishing gas-lights, the patentee remarks, has hitherto been defective in that the connection between the movable slide of the releasing crank-arm and the gas-light has been insufficiently protected against rain and damp—making it possible for water to get into the works, and destroying it.

To remedy this defect, the patentee has a device consisting of an inner casing soldered to the clock-box and supplied with two longitudinal slots. The casing is surrounded by a part cylindrical outer casing, and is closed at the top by means of a cover having a set-off flange and a collar or flange through the packing of which is carried the connecting-rod between the stop-cock and the movable slide—all for the purpose of preventing rain and moisture from entering the mechanism.

APPLICATIONS FOR LETTERS PATENT.

2890.—Scott, H., "Gas-valves." Feb. 13.
2967.—Braun, E., "Acetylene-generators." Feb. 13.
2969.—Winkler, H., "Gas-lamps." Feb. 13.
3021.—Robinson, L. D, and Van Praag, D. J., "Acetylene burner." Feb. 14.
3124.—Southgate, A. W. & F., "Gas-fittings." Feb. 15.
3148.—Calvert, O. W., A. W., & W., "Prepayment meters." Feb. 15.
3168.—Hervieu, G., "Acetylene-generators." Feb. 15.
3174.—Vedy, L. G., and Bilbie, J., "Gas manufacture." Feb. 15.
3240.—Clarke, G. F., "Generating acetylene." A communication from F. H. Williams. Feb. 16.
3244.—Moeller, J., and Valeriola, E. de, "Incandescent mantles." Feb. 16.
3245.—Schmidt, P., and Desgraz, A., "Producer gas." Feb. 16.
3252.—Biggart, A. S., and Carpenter, C. C., "Charging and discharging gas-retorts." Feb. 16.
3298.—Sutcliffe, H., "Incandescent mantles." Feb. 17.
3407-8.—Eveno, A., "Carburettor." Feb. 18.
3457.—The Richmond Gas Stove and Meter Company, Ltd., and Sherburn, W. H. "Gas-fires." Feb. 20.
3482.—Hanwell, H. W., "Pendant lamps." Feb. 20.
3507.—Bartlett, J., "Acetylene-lamps." Feb. 20.
3509.—Griffin, E. F., and Cox, F. J., "Production of gas." Feb. 20.
3527.—Neumann, W., Franke, A., and Eder, R., "Automatic time-switch for gas-light." Feb. 20.
3536.—Batchelor, J. G. H., "Internal combustion motors." Feb. 21.
3549.—Wenger, F. E., "Incandescent burners." Feb. 21.
3569.—Southall, J., "Internal combustion engine." Feb. 21.
3574.—Cleland, J., and Stewart, J. C., "Holders for acetylene gas." Feb. 21.
3588.—Waite, T. R., "Acetylene-generators." Feb. 21.
3605.—Siemens Bros. & Co., Ltd., "Water-meters." A communication from Siemens and Halske, Akt.-Ges. Feb. 21.
3623.—Schwerin, E, "Inverted incandescence burners." Feb. 21.
3651.—Sutton, C. J., and Rudd, J., "Supporting inverted mantles." Feb. 22.
3682.—Chandler, S. & J., and Solomons, J. H., "Four-way safety and bye-pass valve." Feb. 22.
3722.—Porter, W. H., "Gas-engines." Feb. 23.
3766.—Grant, J. G., "Incandescent burners." Feb. 23.
3776.—Leevers, F. W., "Stop and through-way valves." Feb. 23.
3780.—Brunschwyler, J., "Acetylene-burners." Feb. 23.
3876.—Imray, O., "Inverted incandescent lamps." A communication from J. Pintsch. Feb. 24.
3879.—Whitaker, A., and Nicholson, F., "Chimneys for gas." Feb. 24.
3880.—Claughton's Leeds, Ltd., and Austin, E., "Gas-governor." Feb. 24.
3923.—Boult, A. J., "Automatic gas lighting and extinguishing apparatus." A communication from La Société Japy Freres & Co. Feb. 24.
3928.—Negal, M., "Inverted gas-fittings." Feb. 24.
3957.—Hill, G., "Igniting gas." Feb. 25.
3958.—Mitchell, K. M., "Platforms used in charging and discharging retorts." Feb. 25.
3959.—Parker, J., "Steam scurfing bar." Feb. 25.

The report adopted at the eighth annual meeting of Messrs. Crossley Bros., Limited, stated that there had been a satisfactory year's trading in all departments. The amount at the disposal of the Directors was £101,954, out of which a dividend had been paid to June 30 on the preference shares at the rate of 5 per cent. per annum, and on the ordinary shares at the rate of 10 per cent. per annum, amounting to £38,600, and leaving the sum of £63,354 for present disposal. Out of this, the Directors proposed to pay a further dividend for the second half of the year at the rate of 5 per cent. per annum on the preference shares and 12 per cent. per annum on the ordinary shares (making 11 per cent. for the year), which would leave a balance of £19,051 to carry to the next account.

CORRESPONDENCE.

[We are not responsible for opinions expressed by Correspondents.]

Hydraulic Mains.

Sir,—I have noticed in your issue of Feb. 28 the copy of a drawing which Mr. Frank Parsons publishes, and the original of which he states was done 27 years ago. This drawing to my mind conveys little more than a principle, without showing any practical method of applying that principle. It would doubtless be interesting to all your readers if Mr. Frank Parsons would show in detail, by drawings, how the principle was applied in his father's practice.

It is the practical application of a principle that counts, and not vague or abstract notions of principles—shadows only. Certainly, such an arrangement as that shown can never have been put to work with any success.

Nuneaton, March 3, 1905. Geo. Helps.

PARLIAMENTARY INTELLIGENCE.

HOUSE OF LORDS.

The following further progress has been made with Bills:—

Bills read a second time and committed: East Cowes Gas Bill, Truro Water Bill, Western Valleys (Mon.) Water and Gas Bill.

HOUSE OF COMMONS.

Friday, March 3.

MUNICIPAL FRANCHISE (COMPANIES) BILL.

This Bill, which was among the earliest of the Private Members' Bills, is to confer the municipal franchise upon mercantile corporations and companies, and to amend the Municipal Corporations Act, 1882, came up for second reading to-day. It consisted of only five clauses, of which the principal one was as follows:—

Where any corporation aggregate or joint-stock or other company is in occupation as owner or tenant of any land or tenement of the clear yearly value of not less than £10 in any district or place having a local government register of electors, and is rated in respect of the same, an officer of such corporation or company, authorized under its seal, shall be entitled to be entered in the local government register of electors for the said district or place, and to vote at any election held therein, excepting an election for a member to serve in Parliament, and shall be qualified to be elected at any such election as if he were himself the occupier as owner or tenant of such land or tenement, and in all respects fully qualified so to be entered and vote and be elected.

The remaining clauses defined the words "corporation aggregate" as not including any municipal corporation, council of a county or metropolitan borough, county council, urban or rural district council, parish council, or board of guardians; made verbal alterations in certain sub-sections of the above-named Act; and limited to England and Wales the operation of the proposed Act, which was to be cited as the Local Government (Franchise and Qualification) Act, 1905.

The second reading of the Bill was moved by Sir Albert Rollit, who said it was intended to remedy an injustice in regard to the local franchise. Businesses were now largely passing from the hands of individuals to those of public companies; but these could not exercise the municipal franchise, and had no voice in the management of local affairs, though they often carried on the largest businesses, and had the greatest risk and responsibility. If an individual occupied property, he had one vote; and if a private firm occupied property, each of the members had a vote, irrespective of the value of the property, provided he was rated. The proposal of the Bill was simply that where there was taxation there should be representation, and that a company in these circumstances should have one vote, to be exercised by a responsible officer.

Mr. Dalziel opposed the Bill, which, he said, proposed to enfranchise property as against the individual. He moved that the Bill be read a second time that day six months.

Mr. Burns objected very strongly to the Bill, which, if passed into law, would, he said, lead to gerrymandering all over the country, and produce great injustice to the community. If there was to be an alteration in the franchise, it ought to be effected by a Public Bill, and in circumstances when the question could be satisfactorily gone into by representative men on both sides of the House. The honourable member was proceeding with his arguments, when

Sir A. Rollit said he would be quite satisfied not to take the decision of the House on the Bill, and would withdraw his motion.

The following further progress has been made with Bills:—

Bills read a second time and committed: Accrington District Gas and Water Board Bill, Andover Lighting and Power Bill, Aylesbury Gas Bill, Birmingham Corporation Bill, Bolton Corporation Bill, Bootle Corporation Bill, Colne Corporation Bill, Croydon Corporation Bill, Epping Gas Bill, Gaslight and Coke, South Metropolitan, and Commercial Gas Companies Bill, Halifax Corporation Bill, Higham and Hundred of Hoo Water Bill, London Gas Bill, Loughborough Corporation Bill, Morley Corporation Bill, North Sussex Gas Bill, Otley Gas and Improvement Bill, Rhondda Urban District Council Bill, Skegness Water Bill, South Metropolitan Gas Bill, South Suburban Gas Bill, Stockport Corporation Bill, Swansea Corporation Bill, Walker and Wallsend Union Gas Bill, Wrexham Gas Bill.

The Heckmondwike Improvement Bill was presented and read the first time on Thursday.

A petition has been presented by Messrs. Wyatt and Co. for leave to deposit a petition for a Bill from the Malvern Urban District Council.

MISCELLANEOUS NEWS.

GLASGOW CORPORATION GAS SUPPLY.

Reduction of Illuminating Power.

The Glasgow Town Council on Thursday last—Lord Provost Sir JOHN URE PRIMROSE in the chair—had before them a recommendation by the Gas Committee that the illuminating power of the gas supplied in the city should be reduced. The subject has been under consideration for a number of years. On Dec. 7 last, it was remitted by the Sub-Committee on Works to a Special Sub-Committee to consider as to: (1) The advisability of reducing the illuminating power of the gas supply from each of the gas-works from 20 to 16 candles, as authorized by section 21 of the Glasgow Corporation (Tramways and General) Order Confirmation Act, 1901; and (2) the whole question as to the supply of gas to consumers for other than illuminating purposes, and the charges which should be made therefor.

In connection with the remit, the Engineer, Mr. Alex. Wilson, submitted the following report.

In reporting on the advisability of reducing the standard of illuminating power of the gas supply, it is of interest to note that the first parliamentary standards of such supply which regulated the City and Suburban Gas Company of Glasgow and the Glasgow Gaslight Company, as the two private Companies supplying Glasgow, were 10 and 12 candle power respectively. These standards were subsequently increased, upon the Corporation acquiring the undertakings of these Companies, by their Act of 1869, to 25 candles; and this quality of gas was supplied till 1882, when it was reduced by parliamentary sanction to 20 candles. By the Glasgow Corporation (Tramways and General) Order Confirmation Act, 1901, parliamentary authority was obtained to reduce the quality of the gas to 16 candles; but this power has not yet been taken advantage of.

The memorandum, dated January, 1882, prepared and signed by the late Mr. William Foulis and Dr. William Wallace, in support of the reduction of the standard of the illuminating power of the gas supply, is of considerable value; and the following excerpts are taken from it.

The standard illuminating power of gas, as fixed by Act of Parliament, does not arbitrarily decide the quality of gas to be manufactured, but merely the limit below which it cannot be reduced without rendering the manufacturer liable for the penalties stated in the Act. In order that the quality shall not fall below the fixed limit, it is necessary that the gas should be manufactured of a higher quality than the standard.

When gas is said to be of a certain quality, it does not follow that a light equal to that quality will be got from it under whatever conditions it is consumed. In order to get this amount of light, it is necessary that the gas should be consumed in a properly constructed burner, under a suitable pressure, and at the rate of 5 cubic feet per hour. If, however, the gas is burned in smaller quantity, or under greater pressure, the results are widely different; and it has been shown that the same gas may be burned in equally good burners, but under the different conditions as to pressure and consumption found in actual practice, so as to yield a light varying in intensity from that given by a gas of 9-candle quality to that of a gas of 32-candle power. It may be said generally that the larger the flame and the lower the pressure, the greater will be the amount of light developed from the gas.

There would be little difficulty in deciding this question, if the only consideration was: From what quality of gas may be obtained the maximum amount of light, altogether independent of cost? Gas is, however, not now a luxury. It enters largely into the question of cost of production in many manufactures; and the question which the Corporation have to consider is not that stated above, but rather this: From what quality of gas may be produced the greatest amount of light for the least amount of money?

The quality of gas which is most economically manufactured in any particular district depends in great measure on the quality and price of coal most easily obtained in the locality. For example, the coal suitable for gas manufacture most readily obtained in the towns situated in the Eastern and Southern portions of England is the bituminous coal from the coalfields in the vicinity of Newcastle. This coal yields a very fine coke and a large quantity of gas of 16-candle power. Gas of 16-candle power is, therefore, the standard in the towns in the districts above mentioned. Liverpool and Manchester, and the towns in the North-Western portions of England are in convenient proximity to the cannel coal of the Wigan coalfields, which yields a gas of 20 to 22 candles, with a good coke; and 20 candles is, therefore, the standard in that district. Glasgow is situated in the immediate vicinity of coalfields containing cannel which yields a gas varying from 22 to 25 candles; and there are also in the neighbourhood fields of splint coal, which can be had at small cost, from which gas of from 17 to 20 candles can be readily obtained. None of these last are, however, available at present, in consequence of the high minimum standard.

In considering the subject, it should be noted: First, that gas of 28 to over 30 candles is much less permanent in its character than gas of lower quality—that is to say, it is much more easily affected by change of temperature—and frequently during cold weather, while 27 or 28 candle gas is being made at the works, the quality has fallen to little over 25 candles when it reaches the consumer. Secondly, while there can be no doubt that the higher quality of gas will give more light if burned under proper conditions, yet, inasmuch as it is necessary, in order to develop the full amount of light from the gas, that it should be burned at a low pressure, and because gas of high quality when burned at low pressure produces a yellow smoky flame, it is more difficult in practice to develop the full amount of light from it. Lastly, there is the cost of coal necessary to produce this increased quality.

Gas is now being used for many purposes of trade and domestic use, besides that of giving light. A cheap gas would, therefore, tend to develop and encourage many industries, and would greatly increase the rate at which gas is being introduced for such purposes, and would consequently render the property of the Corporation much more secure against any depreciation which might possibly arise should electricity become a competitor for the purposes of general illumination.

It will likewise be observed from the excerpts of the Acts of Parliament, also appended hereto, that the parliamentary standard of the Glasgow City and Suburban Gas Company, and the Glasgow Gaslight Company, who formerly supplied Glasgow, was 10 and 12 candles respectively, while that at present supplied by the Corporation is fixed at 25 candles.

Excerpts Referred to in Report.

(1) The Glasgow City and Suburban Gas Company Act, 1857, section 40, provides: "All the gas supplied by the Company shall be of such quality as to produce from an argand burner having 15 holes and a 7-inch chimney, and consuming 5 cubic feet of gas per hour, a light equal in intensity to the light produced by 10 sperm candles of six in the pound, burning 120 grains per hour.

(2) The Glasgow Gaslight Company's Act, 1857, section 14, provides: "All the gas supplied by the Company shall be of such a quality as to produce from an argand burner having 15 holes and a 7-inch chimney, and consuming 5 cubic feet of gas per hour, a light equal in intensity to the light produced by 12 sperm candles of six to the pound, burning 120 grains per hour.

Excerpts from the memorandum prepared by the late Mr. William Foulis in 1901, as to the reasons why application should be made to Parliament for power to fix the minimum illuminating power of the gas at a lower standard than at present (20 candles) are of value.

(1) The great and increasing difficulty of getting cannel coal in sufficient quantity to ensure the gas manufactured being equal to the present standard of quality. (2) A large quantity of gas is now used for cooking, heating, and motive power purposes; and for these purposes a high quality of gas is not necessary—a lower quality would be more profitable to consumers. (3) The use of incandescent gas lighting is extending very rapidly among consumers for domestic use; and in this case also there is no advantage to be gained by using a high quality of gas. (4) In most towns in England and on the Continent, the quality of the gas supplied for lighting purposes does not exceed 16 candles, from which, with suitable burners, a satisfactory illuminating power can be obtained. (5) There can be no doubt that a lower minimum standard would give the Committee a freer hand in purchasing material, and enable them to buy on more satisfactory terms.

All the foregoing reasons for the reduction of the standard of the illuminating power are of weight in the present circumstances, when it is proposed that the Corporation should take advantage of the powers obtained in their Order of 1901, and send out gas of a lower candle power than is at present supplied.

For a considerable period after the Corporation obtained possession of the gas supply, the illuminating power of the gas was of prime importance, as nearly the whole of the gas produced was used for lighting purposes, and was consumed in flat-flame burners. Even under these conditions, it was proved it would be for the benefit of the consumers to lower the standard of illuminating power; and this was carried out—the quality of the gas being gradually lowered to 20 candles. In 1882, when the first reduction was proposed, very little gas was used for heating, cooking, or motive power; but according to a return made, the following gas appliances were in use in the Corporation area of supply in March, 1904.

Description of Appliances.	In Dwelling Houses of Three Apartments and Under.	In Dwelling Houses of Four Apartments and Upwards.	In Shops, Workshops, Warehouses, &c.	Total.
Gas-fires, radiators, and heating-stoves	1,462	10,101	6,803	18,366
Cooking-stoves (private)	232	639	476	1,347
,, (on hire)	..	..	..	8,369
Range-fittings (private)	488	715	98	1,301
,, (on hire)	..	..	..	18,339
Hot-plates	28	14	1,157	1,199
Grills	13,623	4,882	1,278	19,783
Oven-rings	514	557	68	1,139
Boilers and boiling-rings	16,657	2,591	4,788	24,036
Geysers for baths	37	104	91	232
Pie-warmers	..	..	626	626
Blowers and blow-pipes	..	6	383	389
Bunsen burners	37	71	2,473	2,581
Furnaces and kilns	..	4	152	156
Laundry and tailors' irons	66	70	1,914	2,050
Laundry and calender machines	3	3	285	291
Miscellaneous	15	29	590	634
Totals	33,162	19,786	21,182	100,838

In 1898, the total number of gas appliances in use was 56,268, showing an increase of 79·2 per cent. in six years. The number of gas-engines in use as at May 31, 1904, was 1820, with an aggregate of 13,734-horse power.

The use of incandescent burners for lighting purposes is becoming very general. According to the return made in March, 1904, 179,149 were being used, as detailed below; and since that date many additions have been made, especially in the street-lamps, where at least 15,000 will be required.

—	In Dwelling Houses of Three Apartments and Under.	In Dwelling Houses of Four Apartments and Upwards	In Shops, Workshops, Warehouses, &c.	Total.
Incandescent burners	77,691	49,329	52,129	179,149

Taking into consideration the figures of these returns, it will be noticed that the consumption of gas has greatly changed in its character since the period when the main use for it was by flat-flame burners for lighting purposes. In the 100,838 heating and cooking appliances tabulated, in the 1820 gas-engines, and in the incandescent burners (which may now be taken to number over 200,000), the illuminating quality of the gas is of no importance; the calorific or heating power being the prime factor in determining its value. To all those consumers who value the gas by its calorific power, the proposed reduction of illuminating power, with a reduction in price, would

unquestionably be of benefit, and would encourage an extensive use of gas for these purposes.

In view of the action of the Corporation in connection with the smoke problem of the city, more extensive use of gas for heating and cooking, and for power purposes, should be of importance. The substitution of gas for coal for these purposes would do much towards giving the city that clear atmosphere which is so much desired by those who are interested in the health of the community.

The only consumers who might be injuriously affected by the proposed reduction of the standard to 16-candle power are those who still use flat-flame burners for lighting purposes. With regard to these, seeing they might, by the use of incandescent lighting, easily obtain double their present light for half their present cost, it could be urged that it would be to their benefit to compel them to employ the more economical burner. In those cases where it would still be necessary or convenient for consumers to use flat-flame burners, the Gas Department could intimate that they would be prepared to supply, free of cost, burners suited to the lower candle power of the gas, so that the full lighting value could be obtained. If this was done, and taking into account the ignorance and inattention with which most consumers at present treat their gas-fittings, it would be found that practically no loss would be caused to those consumers through the lowering of the standard. No doubt, as the knowledge of the value of incandescent lighting becomes more generally understood, the great proportion of the gas lighting of the future will be obtained by the use of this more healthful, pleasant, and most economical system of illumination.

The fact that consumers do not know how to burn gas of high quality is often proved by the complaints about "bad or dirty gas which blackens the ceilings." This blackening is due to the gas being only partially consumed, owing to the burners not being suitable for the high quality; and this would not occur to the same degree with a gas of a lower candle power.

[Mr. Wilson then quotes from the "Gas World Year Book, 1905," statistics showing the quality supplied, the price, and the quantity of gas made in all the works in the country manufacturing over 1000 million cubic feet per annum. Excluding Glasgow, they show that, of the total gas made for these large town and cities, only 6·7 per cent. is of 20-candle power or above, 19·8 per cent. is between 17 and 20 candles, and 73·5 per cent. is under 17 candles.]

These statistics proved that the large proportion of the gas now supplied to cities and large towns is of comparatively lower candle power. That the lower qualities of gas are being found more suitable than the old high standards is also shown by the applications made year after year by corporations and companies for permission to lower their standards of illuminating power. The applications this year are (with one exception) all for authority to supply gas of a quality of 14 candles; the one exception being for a 15-candle standard. The supply of gas of lower candle power having been found so serviceable in other cities, both at home and abroad, it can scarcely be doubted that in a city like Glasgow it would also be to the advantage of the community that the Corporation should act on the powers they have obtained, and lower the quality of the gas by degrees to 16-candle power

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The Special Sub-Committee recommended: "(1) With regard to the first portion of the remit, that the illuminating power of the gas supply from and after June 1 next be reduced from 20 to 18 candles; and as and when found advisable by the Gas Committee, that the illuminating power be still further reduced from 18 to 16 candles, as authorized by section 21 of the Glasgow Corporation (Tramways and General) Order Confirmation Act, 1901; (2) Under the second head of the remit, that from and after June 1 next, and until otherwise determined, the charge for gas supplied through automatic meters be at the rate of 2s. 6d. (in lieu of the present charge of 3s. 4d.) per 1000 cubic feet of gas consumed; this reduced charge being, in the opinion of the Engineer and the Treasurer, sufficient to cover any extra cost entailed by this method of supply, and to admit of the Corporation, at the discretion of the department, giving to such consumers the free use of a small cooking apparatus; (3) That further consideration of the second portion of the remit be continued till a subsequent meeting."

Discussion in the Town Council.

Mr. T. Calderwood moved the adoption of the minutes of the Gas Committee. He referred to the recommendation as to the illuminating power of the gas. The Committee, he said, asked authority, as from June 1 next, to reduce the illuminating power from 20 to 18 candles; and as and when found advisable, to still further reduce it to 16 candles. Four years ago the Committee received parliamentary sanction for the reduction of the illuminating power; but they had as yet taken no action, because they wished that time should be given for full consideration of the matter. Having dealt with several points in Mr. Wilson's report, he read the excerpt from the memorandum by the late Mr. Foulis to the Corporation in support of the application to Parliament. He said there had been an increase equal to 79 per cent. in the gas appliances in use during the past six years; and of incandescent burners there were about 200,000 in use. It had been contended that the reduction in the illuminating power would fall very heavily on the occupants of houses of one room and kitchen, and of single apartments; but by the system which had been in use in the past, these people had not taken full advantage of the gas, because they left their burners for years without changing them, and thus lost the benefit they ought to have had by using proper burners. He hoped the Corporation would give the Committee the authority needed to reduce the candle power. The Corporation would be aware that two or three weeks ago Mr. Johnstone put a question in connection with the automatic or penny-in-the-slot meters. He did not know then either the number of these meters or the difference in price. Mr. Johnstone said the cost of gas supplied by the automatic meter was about 3s. 1d. per 1000 cubic feet; but, on inquiry, he was amazed to find that the cost was 3s. 4d. The Committee wanted to do something in this direction for the poorer citizens, and to endeavour to develop this method of supplying gas. They had, in all, about 600 automatic meters in use; and the Committee were anxious to give the people the benefit of this cheap means of obtaining gas. They had done the best they could in the way of the construction of new works, with all modern appliances; and their desire was to give the citizens the benefit of cheap manufacture. Their year was nearing an end, and the time for entering into new contracts was coming on; and unless the Corporation gave the Committee power now, the Committee would be compelled to go on the same lines as in previous years. No one would suffer by the reduction in the illuminating power; and in order to encourage the poorer citizens to use gas more freely, the Committee were considering the advisability of giving a griller free of charge.

Mr. H. J. Miller seconded. Some people, he said, objected to the reduction because they thought it would impair the lighting of shops and houses. If they looked at the tables prepared by their Engineer, they would find, however, that the tendency all over was to reduce the candle power of gas. It was found that the lower candle power was not so expensive to manufacture, and that it gave much greater satisfaction to both householders and users of gas-engines. The Glasgow Landlords' Association had raised objections to the proposal, on the score of health; but he considered that the statements made at the meeting of the Association were contrary to the truth. If they gave the reduced candle-power gas a trial, he was certain the citizens would find that the change would be for the better; and he thought it was a pity a progressive city like Glasgow had been so long making it.

Mr. R. Graham said he did not object to the reduction from 20 to 18 candles; but he thought the Committee ought not to have power to reduce to 16 candles without coming to the Council for authority. He moved an amendment to this effect.

Mr. J. Steele seconded the amendment. He said they would, in his opinion, be all agreed as to the improvement which the reduced illuminating power would be in many respects; but a question which had not received the consideration it deserved was the effect of the change upon the health of the community. He wished to know whether the reduction in the illuminating power would deteriorate the atmosphere in small houses. To this extent there might be something in the statements made at the Landlords' Association meeting.

Mr. W. F. Anderson reminded the Council that at the time the Corporation went to Parliament for authority to reduce the candle power, Mr. Foulis assured them that the lower quality of the gas would not render the atmosphere more filthy than gas of a higher illuminating power. From the health point of view, he thought they had everything to gain and nothing to lose by the change. The meaning of the proposal, though not stated in the report, was to cheapen gas by allowing the Committee to buy in a bigger and more various market. Cheap gas would induce more gas-fires, and would thereby help to purify the atmosphere. It was simply shocking, he thought, that while they were spending two millions of money upon the purification of the Clyde, they were permitting millions of pounds to be wasted in the pollution of the atmosphere. People could not open their windows because of the smoke belching forth from all quarters. Now, however, with gas greatly reduced in price, they would effect a considerable improvement.

Mr. D. M. Stevenson said there could be no doubt that the change would result in a great cheapening of gas. There was certain to be a substantial reduction in price, though it was too early to say how much. They had no authority to go below 16-candle power; but it was likely that they would go rapidly down to 16, and then ask further powers, on the grounds mentioned by Mr. W. F. Anderson. They wanted not only efficient lighting at a low price, but efficient motive and heating power at a low price.

Mr. J. Willock said the Manager had assured him that even with gas of 14-candle power they would have a purer atmosphere than they had at present. They were paying 22s. per ton for cannel coal, but they could buy common coal at less than 10s. per ton at the present time. Some said: "Oh, we do not use incandescent gas lighting;" but he held that the Corporation should be ahead of the people, and should point out to them the desirability of having incandescent gas lighting, in order to get full value for their money.

Bailie Steven thought it would be a fair experiment to reduce the illuminating power to 18 candles, but the Committee should wait until they saw whether the experiment was satisfactory before they reduced it further.

Mr. M. W. Montgomery supported the proposal. He said that the Committee had no intention to go lower than 18 candles in the meantime. In these progressive days, he thought it would be a mistake to tie their hands. In Edinburgh, the illuminating power was 25 candles; and yet he observed that a councillor there complained of bad gas. That seemed to point to this—that a high illuminating power did not necessarily involve a good light. It was not advisable to promise anything in the way of reducing the price of gas. After the experience of a year or two of the new system, this would no doubt come. The Committee had no other aim than to reduce the cost to the community. A reduction of 1d. per 1000 cubic feet meant a saving of £25,000, and a reduction of 2d. meant a saving of £50,000.

Mr. J. Battersby said he had never seen a more practical report presented to the Council; and he was glad to notice the considerate manner in which the Committee proposed to treat those who were not likely to use incandescent mantles, in that they were prepared to supply to these people, free of charge, burners suited to the lower candle power of the gas.

Mr. W. Wallace thought the Corporation should give the Committee authority to reduce the illuminating power to 16 candles, and so enable them to supply gas for motive power at a cheap rate.

On a show of hands being taken, the motion was carried by an overwhelming majority—only three members voting in support of the amendment.

The Vacant Managership at Margate.—We learn that 92 applications have been received for the position of Manager of the Isle of Thanet Gas Company, recently advertised in the "Journal." Out of these, four have been selected; and the final choice will be made next Friday.

WEST HAM GAS COMPANY.

Carburetted Water-Gas and its Collateral Advantages.

The Half-Yearly Meeting of this Company was held last Tuesday, at the Liverpool Street Hotel, E.C.—Mr. J. L. GODLEE in the chair.

The SECRETARY (Mr. A. G. Snelgrove) read the notice convening the meeting; and the Directors' report and the statement of accounts were taken as read.

The CHAIRMAN, in moving their adoption, said the Directors had much pleasure in again presenting an account of the half-year's working which they thought the shareholders would consider very satisfactory. It showed an increase of business all round; and, although they had pursued their established practice of writing off liberally for wear and tear (especially in regard to the slot-meter installations), and had placed a sum of £1000 to the insurance fund, they were able to pay the full dividends out of the profit of the half year, and carry forward £2785 more than was brought over from the preceding half year. The capital account showed an expenditure of £63,000 during the half year. The general increase in the Company's business accounted for a great deal of this. There had been further large payments in respect of the new gasholder at East Ham (which was now completed, and was being tested at the present time); and a considerable amount of work had been done in laying new and larger mains, which a great increase of business at the extreme limits of the Company's district in the neighbourhood of Woodford had rendered necessary. During the twelve months, nine miles of new mains had been laid. The feature of the accounts which would, he thought, have struck the proprietors most was the decreased cost of coal and oil—£39,535, as against £42,069 in the corresponding half of 1903, and the decrease of £1241 in purifying charges and £1000 in carbonizing wages; while they had an increase of more than £8000 in their income from the sale of gas. For this they had, in a large measure, to thank their water-gas plant. At the same time, they would agree that their works had been very efficiently carried on under Mr. Clark's able management when he added that the quantity of gas made during the half year had been 12,851 cubic feet per ton of coal and oil; and the quantity sold, 12,075 cubic feet—the corresponding figures for the whole year being 12,560 cubic feet made, and 11,806 cubic feet sold. The general result might be put thus: They had during the half year sold 64 million cubic feet more gas at a cost of £2534 less for coal and oil. The quantity of gas sold during the half year showed an increase of 10 6 per cent. over the second half of 1903; and for the whole year (1904) the gas made showed an increase of 11 2 per cent., and the gas sold an increase of 11·48 per cent. over 1903. He was happy to say they were able to meet the extraordinary demand caused by the four days' fog just before Christmas; and everybody in the district had as much gas as he wanted during that time. There was a record quantity sent out of the works on Dec. 22, when it amounted to 7,699,000 cubic feet in the twenty-four hours; and during the four days—Dec. 21 to 24—they sent out 28,016,000 cubic feet, or 22 per cent. more than during the same days of 1903. The ordinary consumers had increased during the year by 1324, and now numbered 20,220. The consumers by slot meters had increased by 4412, and now numbered 10,716; while they had somewhere between 3000 and 4000 applications for new slot-meter installations. These they were supplying as fast as they reasonably could; and they were now somewhat overtaking the demand. He must remind the proprietors that the introduction of the incandescent mantle—the weapon which had enabled them to hold their own so successfully in the presence of the rivalry of the electric light—at the same time put into the consumers' hands the means of getting more light than before by the consumption of less gas; and this did have a marked effect on the gas used. He had little doubt that the Gas Exhibition at Earl's Court which gave such an astonishing show of what could be accomplished by this method of lighting, and which was attended by crowds during the whole time it was opened, would have had some effect in leading consumers to substitute the incandescent for flat-flame and argand burners, as well as teaching many of them the advantages of gas stoves and cookers. He did not wish to be understood as complaining of this result. It would probably teach numbers who never used gas to become consumers. But he wanted the proprietors to keep these things in mind in considering the increase in the sale of gas which they were able to report that day. He did not think there were many other figures to which he need make reference. The amount received for residuals showed a falling off of £4189, almost the whole of which was in the sale of coke—the price having been lower; and there having been a considerable reduction (to the extent of 3457 tons) in the amount made, corresponding with the smaller quantity of coal carbonized. Rates and taxes were up as usual; and the Directors were still engaged in a discussion with the Local Authorities with regard to a proposal to largely increase the rateable value of their property. Against this, they had appealed; and the matter was still unsettled. They would probably have to submit to some increase; and the charge in the accounts included some provision for the probable rise. They had carried £1000 to the insurance fund, to which no addition beyond the accruing interest had been made for several years. It was a fund that had been useful to them in the past, and might well be again, though it was not altogether easy to get out money that had once been put into it. But they had thought it right, with the increasing business of the Company, to make some addition to it which their funds enabled them to do. The past year had been so successful that they did not like to prophesy for the future. The effect of the incandescent mantle and the increasing number of slot-meter installations had both to be taken into account. But they knew of nothing particular to give them any fear as to the future. A continuation of the present rate of profit might not improbably lead them before long to consider whether they could not reduce the price of gas to consumers; but they did not think this should be done until they saw their way to do it without risk to the interest of the shareholders. A decrease of 1d. per 1000 cubic feet at the present time would mean a reduction of about £5590 in the rental in the year; and while the consumers would get the benefit of this, the proprietors would be only entitled to divide £932 more among themselves. One other matter he would refer to. He had on a former occasion alluded to the capital cost to the Company of their slot-meter installations; and he should like to give them the present figures. The actual cost of fitting up an installation, with meter, stove, two bracket lights, and one pendant was £5 14s. 6d. To this must be added the cost of bringing in the service-pipe from the main; and this, of course, varied with the length of the service and the nature of the road which had to be opened; but, on an average, it worked out at about £2, making the total capital charge for such installation £7 14s. 6d., which was somewhat less than he stated a couple of years ago. They wrote this down severely every half year. They would all recognize, as his colleagues and himself did, the excellent work that must have been done at the works of the Company, to make it possible for them to present to the proprietors such a report and balance-sheet as the one which he now had the pleasure to move for adoption.

The DEPUTY CHAIRMAN (Mr. T. S. Geere) seconded the motion.

Colonel STUART said at the last meeting a proprietor spoke of the high rate of the working expenses of the Company. It appeared from the revenue account that the gross receipts for the half year were £122,289; and the working expenses amounted to £92,117. Now, if these figures were accurate, he considered this a high rate for the working expenses. It was 75·3, per cent. or more than three-quarters of the revenue of the half year. Well, there was a bit of sunshine in this even, because he found, if his figures were correct, that in the corresponding half of the previous year the working expenses amounted to 80 per cent. He had compared these results with several companies in which he was interested. He found the working expenses of one railway company were equal to 59 per cent., a second 63 per cent., a third 73 per cent., and a fourth 56·6 per cent. Now he should like to ask how it was the working expenses of a gas company were so high. He had not been able to compare these expenses with those of other gas companies; but from what he understood it was stated by a proprietor at the last meeting that theirs was considerably higher than many other gas companies. If incorrect in this, the proprietors would be delighted to have the matter put right. Rates and taxes were a black beast for everybody; and he was glad the Directors intended keeping a jealous eye on them. The more jealous the eye, the better it would be for the Company.

Mr. J. H. BROWN (Nottingham) said it was always a pleasure to attend the meetings of the proprietors, because every half-year's accounts showed an advance on the previous one. In almost every item in the manufacturing charges on this occasion, there was considerable improvement, and everyone showed a reduction, with the exception of rates and taxes, which, on the contrary, always increased. Coal had cost less, wages were lower, and recently the make of gas per ton of coal, he believed, reached a record figure. The rates had only shown an increase of 0 09d. per 1000 cubic feet of gas sold; but, compared with other similar undertakings, the total amount of the rates and taxes was not an out-of-the way figure. Colonel Stuart had asked a question as to the percentage that the working expenses bore to the gross revenue. It would perhaps be of interest to him to know that the West Ham Company's accounts in this respect compared very favourably with those of the Gaslight and Coke Company, whose total receipts for gas amounted to 2s. 10·23d., against the West Ham 2s. 10·29d.; and the balance of revenue was 11·79d. in the case of the Gaslight and Coke Company, against 10·8d. in the case of West Ham—showing that the latter were working for less profit than the larger Company. Their able Engineer (Mr. Clark) had evidently discovered how to make a very low-grade coal gas economically. There was, too, an abnormal increase in the consumption of gas, which was a most gratifying sign. One anticipated an increase in the case of the slot-meter consumers, because this was a field which had only recently been entered upon by the Company; but what was still more satisfactory, an increase was also recorded in the case of ordinary consumers. With other undertakings, there was usually a decrease in the rate of increase of the latter when they recorded such a large increase in the slot meters. The proprietors were to be congratulated on the excellent results now put before them; and these results were doubtless due to the able management by the Directors and the officials. West Ham had always done equally as well in gas and residuals as the Gaslight and Coke Company. Their balance-sheets, as he had already said, were very similar; and, even this year, the coal and oil per 1000 cubic feet of gas sold had cost considerably less in spite of the larger Company's advantage in size, and their much more favourable geographical position. The shareholders showed their confidence in the Board by their sparse attendance that day; and he considered that their confidence was fully justified. The balance-sheet also inspired confidence by the way it was presented; and if the Chairman would only be good enough to give them the total amount of carburetted water gas made, it would put them in possession of more complete figures than those given by any similar undertaking. The Chairman always welcomed fair criticism of the balance-sheet by any of the proprietors; and, with his consent, he would like to call attention to an important matter. The South Metropolitan Gas Company were practically the first to obtain a reduction in the statutory candle power. Sir George Livesey pleaded that it was necessary to reduce the illuminating power to 14 candles in order to supply gas of such a quality that it could be obtained from the available coal supply without the need of artificial enrichment. Sir George had further said that, if he knew how to make a lower candle-power gas economically, he would certainly apply for the necessary powers. But here, at West Ham, immediately the Company obtained a lower standard of illuminating power, and not until then, they erected an enriching carburetted water-gas plant. And they found from the figures given in the balance-sheet with regard to the coke and oil that a fairly, if not a very high illuminating power carburetted water gas was being used, and consequently a very low grade coal gas. With such mixed gases, it was always an extremely difficult matter to maintain the air equivalent at a constant figure, particularly because there was no direct relation between this air equivalent and the candle power or the calorific power. The air equivalent was the proportion of air to the gas required for its complete combustion in atmospheric or incandescent gas-burners. Sir George Livesey had impressed this matter very forcibly upon the gas industry; and it could not be too strongly insisted upon. Considering

these difficulties in conjunction with the supply of this mixed gas and the financial aspect of the question, it was a mystery to many people as to how the Company could make and supply carburetted water gas economically. Sir George Livesey (with his accustomed fearlessness) had abandoned carburetted water gas plant at the South Suburban Gas Company's works; and he had given good reasons for so doing. He knew many others throughout the Provinces who had also shut down their water-gas plant temporarily, and the majority had considerably curtailed their production. Doubtless the Company depended largely on the collateral advantages; and this was, he supposed, the explanation. Looking at it from the practical point of view, what were these collateral advantages? Surely if they were of any real advantage, they would reflect themselves forcibly on the balance-sheet. There was the question of coal. It was said they could purchase cheaper coal of an inferior quality, seeing that the quality of the gas was obtained from the carburetted water gas. It was instructive to note that the cost of coal was lower with the West Ham Company than with the Gaslight and Coke Company. It was further said that the cost of wages was less, and the repairs and maintenance of retorts and works generally, owing to the fact that the retorts could be worked more regularly—fluctuations in the demand for gas being taken up entirely by the water-gas plant. On the other hand, it was said that more favourable markets were obtained for the coke. They had less for sale, and consequently obtained better prices. They were, however, all agreed that tar would suffer slightly, and that sulphate of ammonia receipts would be somewhat less. He had compared their balance-sheet with the balance-sheet of the Gaslight and Coke Company—a similar undertaking in many respects with the exception of size, and a Company that was also using carburetted water gas. The only undertaking in London not using water gas was the South Metropolitan Gas Company. A comparison of their accounts with those of the West Ham Company was certainly very instructive; and it should be noted that manufacturing charges solely were considered, and those which were affected by the so-called collateral advantages. Coal cost the Company 14·15d. per 1000 cubic feet of gas sold; while the South Metropolitan Company obtained theirs for 13·2d.—a difference of 0·95d. Wages were 3·24d. for West Ham, against 2·51d. for the South Metropolitan Company—a gain of 0·73d. Repairs and maintenance of works was for West Ham 4·95d., against 4·09d. for the South Metropolitan Company—a difference of 0·86d.—showing a total gain in less payments by 2·54d. Then, in coke receipts, the South Metropolitan Company realized 6·53d., against 4·07d., or a gain of 2·46d.; and this was the principal item on which the use of carburetted water gas was supposed to help them. Then, in tar, the South Metropolitan obtained 1·38d., and West Ham 1·16d. For sulphate of ammonia, too, the South Metropolitan Company received 2·42d. against 1·44d. by the West Ham Company—showing a total difference in favour of the South Metropolitan Company of 6·2d. per 1000 cubic feet. It was instructive to note that, on every single item, the South Metropolitan Company were considerably better off than the West Ham Company. Of course, there were other figures which came into consideration; and there was also the fact that the South Metropolitan Company were considerably larger than the West Ham Company. But in view of these very great differences in manufacturing charges pure and simple, one was tempted to ask whether they were not expecting too much from these collateral advantages. He put the figures before the Directors for their consideration, and trusted they would accept his statemenis as friendly criticism. Personally he was satisfied with the management of the undertaking; and, as he had already said, the proprietors were to be congratulated on the excellent results that had been presented. At the same time, there were still figures which they had not yet attained, and ideals which had not yet been reached.

Mr. A. W. Oke thought there was some danger in drawing comparisons and inferences as the last speaker had done. He (Mr. Oke) and probably others present were shareholders in gas companies who had carburetted water-gas plants; and if they were to ask the engineers of those companies if they would care to be without the plants, they would say they would be very sorry to be so. One of the most important recommendations of this system of gas making was that, for a small capital outlay, they were able to deal quickly with a large output of gas, and at the time of the year when it was required, instead of having a large amount of capital locked up for this purpose. He had only recently visited a large number of works in the Provinces; and they were all uniformly pleased with the results of water gas.

Mr. H. W. Crow pointed out that the use of carburetted water gas caused the withdrawal of a large amount of coke from the market; and this, of course, had the tendency of producing better prices than would otherwise obtain. The South Metropolitan Company had participated in the advantage of rises or improvement that this caused in the price of coke, although they did not contribute to it.

Mr. Cleverley said he was gratified to find with regard to the slot-meter supplies that the remarks he made at the last half-yearly meeting had brought about a reduction in the outlay on these installations. The average charge, he understood, was now £7 14s. 6d.; but in the case of a neighbouring company, he believed the charge was under £7. Of course, circumstances altered cases. He also referred to the new show-room the Company had opened in the High Street, and suggested that arrangements should be made to keep it open late, in order to show off the lights.

The Chairman thought perhaps their Engineer and General Manager (Mr. John Clark) would like to reply to Mr. Brown.

Mr. Clark said he should like to express the opinion—as a shareholder, and not as an officer of the Company—that he did not think Mr. Brown's remarks were altogether the sort of thing for a meeting of shareholders. It was more fitted for a meeting of gas engineers, because they could not expect the Directors of a Company to understand such matters in a way that they could reply to any question of this kind offhand. He (Mr. Clark) would be glad to discuss the matter with Mr. Brown at some future time; but, at a meeting of proprietors, it would really be a waste of time. They must do the best they could for the proprietors; and he thought they had given them a very good report. What the proprietors desired was a dividend; and they did not want to know whether it was made by water gas or by coal gas. He therefore asked the proprietors to accept it from him that the Board had done the best they could. With regard to Colonel Stuart's remarks, he did not think he could compare the working expenses of a gas company with those of a railway company. The large writing-off for the depreciation of slot meters had to come out of revenue; and it was policy to do it. There were things of this sort which did not apply to railway companies. He believed they were doing their work as well in every respect as any of the other London Gas Companies; and he did not think there was any other company who sold as they did over 12,000 cubic feet of gas per ton. The number of gallons of oil they allowed as the equivalent of a ton of coal was the same figure that they adopted each year for the purposes of comparison; and he supposed that was good enough for the proprietors. The water-gas plant had been very useful; and it would continue to be so. The South Metropolitan Company did their work in their own way; and the West Ham Directors did the best they could for the proprietors. And they would continue to try to get them a dividend, whether by water gas or coal gas.

The Chairman said he did not think, after Mr. Clark's remarks, there was much left for him to say. As to Mr. Brown's speech, he was first inclined to express great obligation to him for (with his knowledge and experience) his compliments on the report and accounts. As to his further remarks, what Mr. Brown had said might be perfectly true; but it was rather more of an expert discussion than they could usefully go into in that room. He thought, if Mr. Clark and Mr. Brown would meet together and thresh these figures out, they would have an exceedingly useful and interesting time. If the proprietors would allow him, he would leave these matters here, as he did not feel himself capable of dealing with them. He was glad Mr. Cleverley had taken to his own credit the reduction that had been made in the cost of the slot-meter installations. He (the Chairman) was afraid that possibly the Directors might take some credit to themselves for this, and would not feel that they were unduly driven by Mr. Cleverley, but that the reduction was partly the result of their desire to do the best for the Company.

The motion was unanimously carried.

A dividend was declared at the rate of 5 per cent. per annum on the preference and consolidated ordinary stock; the retiring Directors (Mr. H. Cecil Pelley and Mr. F. Nicholson) and Auditor (Mr. W. Hopkins) were severally re-elected; and resolutions were passed recording the proprietors' hearty appreciation of the services of the Chairman and Directors and officials.

AUSTRALIAN GASLIGHT COMPANY.

The Half-Yearly General Meeting of this Company was held at the Royal Exchange, Sydney (N.S.W.), on the 26th of January—Mr. G. J. Cohen, the Chairman, presiding over a large gathering.

The Secretary (Mr. R. J. Lukey) having read the advertisement convening the meeting, the report of the Directors, which had been previously circulated, was taken as read. In the course thereof they stated that the net profits, with the balance brought forward, amounted to £65,947; and they recommended a dividend for the six months of 9s. per share, free of income-tax, which would absorb £56,250, and leave £9697 to be carried forward. In view of the continued expansion of the Company's business, they proposed to issue the balance of the authorized capital of the Company by the creation of 16,666 shares of £6 each, to be allotted to the existing proprietors at a premium of £6 per share, and in the proportion, so far as practicable, of one new share to every 7½ old shares, on conditions fully set forth in the report. The Engineer (Mr. T. J. Bush, M.Inst.C.E.) reported that the whole of the plant was in good order and condition.

The Chairman, in moving the adoption of the report, expressed his pleasure at being able to compliment the shareholders upon a most favourable half year. The business was steadily increasing; that of the six months under review being far in excess of any similar period in the Company's history. The increase in the sale of gas, notwithstanding the competition of the electric light, was most gratifying; and there was no reason to believe that the future would be other than advantageous to the Company, as the growing demand for cookers, fires, and other gas appliances must bring about very beneficial results. With one exception, the Company had never disposed of so many cookers as during the past twelve months; and each year, as their "indent" for gas-fires and other heating apparatus came to hand, they were speedily disposed of, thereby increasing the sales of gas. The demand for coke, which set in during the early part of the year, had been fully maintained; resulting in the disappearance of the large stocks which had for some time accumulated at their Mortlake works; and there was reason to expect that in the future it would be disposed of as quickly as it was made. The workmen, being dissatisfied with the rate of wages paid by the Company, applied for an increase, which the Board, after much deliberation, felt they could not grant. The men thereupon referred the matter to the Arbitration Court for settlement. The men's application was made to the Registrar of the Court in September, 1902, but the hearing did not take place until March last year; the attempts to settle the points at issue by conference with the men and the Company's officials being ineffectual. The award was given in December, after an interval of two years and three months from the filing of the men's claims, resulting in the ultimate restoration of the 1889 scale of wages. An advance of 3d. per day took place on the 1st of January, and a further advance of 3d. per day would come into force on the corresponding day next year. It was estimated that the additional cost to the Company would amount to £2400 this year, and about £5000 per annum from Jan. 1, 1906. This large increase in the expenditure, following as it did upon the recent land, income, and municipal taxation, and the heavy customs, wharfage, and harbour dues, tended to keep gas at its present price, which nevertheless compared very favourably with that charged in England, when the extra cost of labour and material was taken into consideration. Had not these imposts been made, the price of gas would have been reduced. What had been

termed "The Great Gas Exhibition of 1904" was opened by the Lord Mayor of London, at Earl's Court, in November. The enterprise had been exceedingly successful; and the results were highly beneficial to the gas world generally, not only in revealing in an especial manner the steady progress gas was making in England and on the Continent of Europe, but also in confirming the opinion of all those connected with the industry, that the gas companies could look with complacency upon the efforts that were being made by the electric lighting companies to force gas out of the field of artificial lighting. It was exceedingly interesting to read the reports coming to hand of the various systems of incandescent and high-pressure gas lighting displayed at the exhibition. The brilliancy of some of the lamps was described as being far superior to the electric light, one of the leading London daily papers going so far as to say that "the electric light was nowhere." The Company hoped, in due course, to make a display of some of the lamps in Sydney, so that customers might reap all the advantages to be derived from these recent inventions. Gas-cookers, gas-engines, and other gas appliances showed a wonderful advance in efficiency; and in this connection he might add, for the benefit of those who, notwithstanding all these improvements, were still determined to adopt the electric light, that independent installations with a gas-engine were by far the most economical. It was also pleasing to note the unanimity of the public Press in London and the Provinces in favour of gas lighting, as the result of the exhibition; medical journals—the "Lancet" in particular—being included. Having quoted some of the remarks made by that paper, the Chairman went on to refer to the speech of the Chairman of the Gaslight and Coke Company at the banquet in connection with the opening of the exhibition, in which he furnished some startling figures respecting the three London Gas Companies. He showed that in thirty years the capital had increased from £8,259,277 to £38,000,000; the coal carbonized from 1,225,837 to 3,076,772 tons; and the quantity of gas sold from 10,350,379,000 to 34,928,686,000 cubic feet. In 1870, no oil was used in gas manufacture; whereas now upwards of 16 million gallons were consumed yearly by these Companies alone. The Board of Trade returns revealed even more interesting facts. The capital of the authorized gas undertakings in the United Kingdom had increased in twenty years from £50,000,000 to £113,000,000, and the quantity of gas sold from 66,613,944,000 to 147,732,584,000 cubic feet. Comparing their own figures for the past thirty years, he found that the capital employed in 1874 was £192,000, the coal carbonized 16,500 tons, and the quantity of gas sold 165 million cubic feet; whereas last year the capital had increased to £750,000, with a debenture issue of £300,000, the coal carbonized was 129,456 tons, and the oil used 1,298,667 gallons, or equal to 173,313 tons of coal for the year, and the quantity of gas sold was 1,854,710,000 cubic feet. Carrying the comparison still farther, the Australian Company's progress was shown in a very marked degree by the following figures:—

	Three London Companies.	Australian Gaslight Company.
Increase in capital in 30 years	360 per cent.	446 per cent.
,, ,, coal carbonized	151 ,,	950 ,,
,, ,, gas sold	237 ,,	1023 ,,

He might also add, as a significant fact, that the Gaslight and Coke Company reported that during the past twelve months alone they had supplanted electricity in between 700 and 800 establishments. The Chairman then made reference to the proposed increase of capital, and explained that since the last issue in 1901 the Company had extended their business to Eastwood, Beecroft, and Pennant Hills, laid a new 18-inch main, erected a gasholder, governor-house, &c., and laid out large sums of money for mains and services, including penny-in-the-slot installations; the extra capital expenditure reaching nearly £250,000. He said the penny-in-the-slot meters were as much appreciated as ever; the number at present fixed being 19,886. The public lamps had been reduced, consequent upon the introduction of the electric light in the city and the discontinuance of public gas lighting by the Glebe Council; but there were now 10,128 lamps in use. The sale of gas-cookers for the past half year had brought up the total sales by the Company to 13,898. The gas-engines also showed a satisfactory increase, totalling to 656, ranging from ½-horse to 165-horse power. The consumers numbered 65,762—an increase of 1713 for the six months. The day consumption of gas now equalled 42·4 per cent. of the total deliveries. During the half year, 47 miles of additional mains and services had been laid, making a total of 1909 miles.

The Deputy-Chairman (Mr. J. H. Storey) seconded the motion, and it was carried unanimously.

The Chairman then moved the necessary resolutions creating the 16,666 new shares mentioned in the report; and they were adopted.

The Directors and officers were heartily thanked for their services during the half year; and the proceedings closed.

ASCOT DISTRICT GAS COMPANY.

The Ordinary General Meeting of this Company was held at the London Offices, No. 50, Cannon Street, E.C., on Monday of last week—Mr. Joseph Manwaring in the chair.

The Secretary (Mr. W. A. Schultz, F.C.A.) read the notice convening the meeting; and the report and accounts were taken as read.

The Chairman said he was pleased to be able to bring before the shareholders evidence such as the accounts furnished of the continued prosperity of the Company. It would be seen from the revenue account that the sale of gas during the half year ended Dec. 31 had produced just £100 more than in the corresponding six months of 1903. As far as the residual products were concerned, tar and ammoniacal liquor showed a corresponding increase; but, on the other hand, the price of coke had gone down—this item not having yielded so much as in the previous year by about £28. This, however, was not discouraging, inasmuch as, with the exception of a "snap" of cold weather before Christmas, the winter had been exceptionally mild; and consequently they had had to suffer the same as all other gas companies, and let the coke go at a lower price than perhaps they felt it should realize Still, the difference was small; and on the whole the revenue account exhibited an increase of £66. On the other side, the cost of manufacture was practically identical with that of the previous half year; the only exception being that a slightly increased charge had been incurred in the repair and maintenance of plant. This, however, was only natural, as with the growth of the works the cost of maintenance must necessarily be greater. In connection with distribution, the charge was also somewhat heavier for repairs and renewal of meters. The Company had now been in existence for 23 years; and it was only prudent that, as the meters were changed after this length of time, ample provision should be made for the future by a sufficient allowance under this head. The remaining charges called for little or no comment from him; the result being a profit carried to net revenue account of £1946, against £2087 the previous year. This did not show a falling off in the prosperity of the Company, but rather that the resources were being devoted to husbanding the stability of the undertaking. The quantity of gas sent out during the six months was 22,339,000 cubic feet, as compared with 21,693,000 feet in the previous half year, or an increase of nearly 3 per cent.; while the amount sold was 20,024,000 cubic feet, against 19,786,000 feet, or an increase of 238,000 feet. The unaccounted-for gas amounted to 9·3 per cent., which was slightly more than in the corresponding period of 1903. But in this connection it should be borne in mind that the Company had about 43 miles of mains, mostly in a rural district, so that the percentage named could not be regarded as unsatisfactory. The make of gas per ton of coal carbonized was 11,112 cubic feet; and the quantity sold, 10,012 feet. As was stated in the report, it would be necessary shortly to improve some of the plant, especially by laying down new and larger purifiers. This matter was already receiving the attention of the Directors; and it was with a view to meeting the outlay that would thus be incurred that they proposed to set aside £1200 out of the accumulated profits of previous years In the near future it would also be necessary to go more carefully into the question of retort-house accommodation; and this, too, was receiving the attention of the Board. At the present time, the capital expenditure of the Company worked out at £17 8s. per ton of coal carbonized; whereas five years ago it was £20 8s. At Dec. 31, 1903, the ordinary consumers numbered 642; and at the end of last year, 659. In the same period the prepayment meter consumers had increased from 283 to 361; and the number of stoves out on hire, from 425 to 510. Under these circumstances, he had no hesitation in congratulating the shareholders upon another year of successful working, and in joining them in the confident hope that the future had still further prosperity in store. He then moved the adoption of the report and accounts.

Mr. Alfred Kitt seconded the resolution.

Mr. H. W. Smith said he noticed that, in order to make provision for the renewal of some of the plant, the Directors proposed to set aside £1200. He supposed they would have to raise further capital, as they really had not the money in hand to set aside.

The Secretary explained that it was intended the work should be done out of revenue, so as not to increase the capital charges, which were heavy enough already.

Mr. Smith remarked that if it was an addition, it was a capital charge.

Mr. Kitt: Yes; you can charge it to capital if you like. The object is to reduce the capital account.

The Secretary said that, strictly speaking, a portion of the work ought to be charged to capital; but the Directors thought it wise, in view of the large sum that had been accumulated out of the profits of previous years, to meet the whole of the outlay in the manner proposed, instead of dividing it up.

The motion was then carried.

On the proposition of the Chairman, seconded by Mr. H. C. Walker, it was agreed that a dividend at the rate of 5 per cent. per annum for the half year, free of income-tax, should be paid; that the sum of £1200 should be set aside to provide for the renewal of plant; and that the balance of £406 should be carried forward.

Subsequently the retiring Director (Mr. Manwaring) and the Auditors (Mr. T. W. Welton, F.C.A., and Dr. H. J. Strong, J.P.) were re-elected.

Moved by Mr. Rymer, and seconded by Mr. Walker, a hearty vote of thanks was accorded to the Chairman and Directors and the officers of the Company.

Brief acknowledgments by the Chairman and the Secretary brought the proceedings to a close.

Lewisham Borough Council and the South Suburban Gas Company.—The Lewisham Borough Council last Wednesday instructed the Solicitor and the Town Clerk to obtain expert evidence and take all the necessary steps with respect to a notice of appeal received from the South Suburban Gas Company against the Magistrate's decision at the Greenwich Police Court in reference to the complaint made against them as to an alleged excess of sulphur in their gas on Nov. 28 last.

Wandsworth and Putney Gas Company and New Streets.—At the meeting of the Wandsworth Borough Council on Wednesday, a letter was received from the Clerk of the London County Council relative to the proposed formation by the Wandsworth and Putney Gas Company of new streets out of the eastern side of Merton Road, Wandsworth. He stated that the Company declined to agree to the Borough Council's proposal that one half the cost of paving the land required for widening Merton Road should be defrayed by the Council; pointed out that, in the event of the present application being withdrawn, the opportunity of obtaining the widening at comparatively small cost to the public might be lost; and asked whether the Council could see their way to relieve the Company of all paving charges and any expenses incurred in connection with the widening and making up of the road. Upon the recommendation of the Highways Committee, it was resolved to inform the London County Council that the Borough Council, having further considered the matter, were willing to relieve the Company of all paving charges and any expenses incurred in connection with the widening and making up of the road; also that application should be made to the County Council for a contribution towards the cost of the improvement.

PROVINCIAL GAS AND WATER COMPANIES.

Gas.

Gas Supply at Brighton.

At the half-yearly meeting of the Brighton and Hove Gas Company last Friday, the Directors reported that the sales of gas in the six months ending Dec. 31 had been slightly more than those for the corresponding period of 1903, but that the rental was less owing to the reduction in prices made at the beginning of the year. The return from the residual products was also less, attributable partly to the lower prices realized for the coke and tar. The Directors nevertheless had thought it desirable to sanction a further reduction of 1d. per 1000 cubic feet, to take effect from the 1st of January last. The revenue from the sale of gas in the half year was £81,853, and from residual products £16,212—the total receipts being £105,504. The expenditure was £79,584, and the amount carried to the profit and loss account £25,920. The sum available for distribution was £36,042; and the Directors recommended the declaration of dividends at the rates of 6, 4, 11, and 8 per cent. per annum on the "B" and "C" preference, original ordinary, and "A" ordinary stocks. These would amount to £23,653, and leave a balance of £12,389. The working statements included in the accounts showed that 35,264 tons of coal and cannel and 563,289 gallons of enriching oils were used in the manufacture of gas, of which 528,092,300 cubic feet were sold for private consumption, and 26,458,300 cubic feet for public lighting, &c.—together, 554,550,600 cubic feet.

Prosperity at Canterbury.

At the annual meeting of the Canterbury Gas and Water Company, the Chairman (Mr. D. Amos) stated that, owing to the adoption of the regenerative system, they were now obtaining more gas, and of a superior quality; the increase in the make being 1335 cubic feet per ton. In spite of the competition of the municipal electric light undertaking, the business continues to grow; the output of gas last year having been 4·33 per cent. more than in the previous twelve months. A considerable amount of capital has been spent on the gas undertaking during the past two years; but notwithstanding this, the Company are able to pay the full statutory dividend. The prepayment system continues to grow; there being at the present time fixed 2590 slot meters and 1671 slot cookers. The water-rental is also increasing annually; and as all the plant has been duplicated, an accident to the machinery is not likely to interfere with the supply. In the course of his remarks, Mr. Amos referred to the offer of the Company (which was noticed in the "JOURNAL" at the time) to fit incandescent gas-burners to all the lamps free of charge. He stated that this offer was made in consequence of complaints in the Press as to the inadequate lighting of the city, but that so far no response had been received to the Company's proposals. The complaints as to the public lighting, were, he said, admitted on all hands to be fully justified; and the unsuitability of the electric lamps (other than the arc lights) was obvious to everyone. In the early part of last year, some inquiry was made as to the cost of the present lighting; and it was found that the charge on the rates had increased from £1584 to £2588. Possibly this amount would be further augmented when the accounts were next made up. It had been urged that a large addition had been made to the number of lamps. No doubt that was so; but it should be borne in mind that the additional number had been nearly all placed in the area which was formerly lighted with gas. There was thus a large additional expenditure from the public funds without any advantage whatever; and the Company had good grounds for complaining of this outlay, because they were the greatest contributors to the rates, and therefore bore a large share of the burden which went to supplement the electric light funds. In acknowledging a vote of thanks, the Secretary (Mr. James Burch) remarked that he had attended sixty-three yearly and half-yearly meetings of the Company; and this represented a very long period in a man's life.

Heavy Rates Check Cheaper Gas at Eastbourne.

The shareholders of the Eastbourne Gas Company had a double pleasure at their half-yearly meeting on Monday last week. They had their veteran Chairman (Dr. G. A. Jeffery, J.P.) in his accustomed place, notwithstanding a bad cold; and they went away with dividends at the rates of 15 and 12 per cent. per annum. The accounts for the half year ending the 31st of December showed that the revenue was £33,852, the expenditure £25,677, and the profit £8175. A sum of £23,034 was available for distribution; and after paying the dividends named, there was £15,315 to the good. Dr. Jeffery made a most interesting speech in moving the adoption of the report. He said the sale of gas had risen from 178,413,000 to 183,579,000 cubic feet—an increase of 5,166,000 cubic feet, or nearly 3 per cent. The number of ordinary consumers was 3999, and there were 3345 coin-meter consumers, or a total of 7344—a gain on the year of 340. The residuals had sold at a lower price; but they had produced the substantial sum of £6817, against £6985 last year. The rates and taxes were about the same; and they were enormous. The amount paid in local rates for the half year was £1045; so that really the Company were paying more than £2000 a year in rates and taxes. If they were relieved of this, they would be enabled to supply gas to the town at 2s. 6d. or 2s. 6½d. instead of 2s. 8d. per 1000 cubic feet. The taxation of Eastbourne was becoming lamentable. Fancy a little Company like theirs paying £2000 a year in rates and taxes! The consequence was that the people suffered. They could have the gas 1½d. or 2d. per 1000 cubic feet cheaper but for the rates. He thought that the great feature of the accounts was the amount received for residuals. They had returned the substantial amount of more than £6000, which was highly creditable to Mr. Hammond (the Resident Engineer and Manager), and would be creditable to any management. Coal was somewhat cheaper. Tar and coke were down in price. He stood there year after year, and half year after half year, and declared a dividend of 12 or 15 per cent. How was it done? Well, there was a great deal of anxiety in the getting of it. But it was got, and he hoped the shareholders would compliment and encourage the Board thereon. They would then go back and do the same again, if possible. Referring to the Company's central offices, which have been described in the "JOURNAL," Dr. Jeffery said their utility had been demonstrated very fully during the past half year; the number of inquiries as well as orders actually recorded in the books for the six months being nearly 10,000. The cookery lectures and demonstrations held in that room (as part of the scheme of technical education arranged by the Eastbourne Corporation) continued to attract a large number of ladies on Wednesday evenings and Thursday afternoons. Some 300 children also received daily instruction in domestic matters as a part of the scheme of elementary education. As to the upkeep of consumers' incandescent burners, the almost universal use of these burners had induced the Directors to accede to numerous requests to look after and attend to them for the consumers. At the present time upwards of 1800 were attended to weekly, or as occasion required, for a fixed quarterly payment; and the number was constantly increasing. Mr. C. E. Botley seconded the motion. Referring to the Chairman's remarks on the subject of the rating of the Company, he said he did not think Eastbourne was hit so hard as some other places. The report was adopted, and the dividends recommended were declared. Among the complimentary votes was one to the staff, which was acknowledged by the Secretary (Mr. J. S. Garrard) on behalf of himself and Mr. Hammond. He said the staff were always willing to give expert advice as to lighting, heating, or cooking, to all who needed it. With regard to rates, the Company had been paying during the past six months 1·33d. per 1000 cubic feet sold, or nearly 1½d. on every 2s. 8d. received.

A Progressive Sussex Company.

The proceedings at the recent annual meeting of the East Grinstead Gas and Water Company showed that though the increase in the consumption of gas was not very great last year, the progress of the Company was good. The Chairman (Alderman W. V. K. Stenning, J.P.) said that, owing to the saving effected in the working expenses, the Directors had been able to put a better statement before the proprietors. It was thought advisable to fix the dividend at 9 per cent., free of income-tax, rather than to declare one of 10 per cent. from which the tax would have to be deducted; so that the difference in reality between the two was only 10s. The lower sum would enable the Directors to carry forward a very substantial balance, and thus secure the means of paying an interim dividend in the autumn. So far as they could see, if no accident occurred and no unforeseen event arose, there was every reason to hope that twelve months hence they would be able to make as satisfactory a distribution as they were deciding upon that day. The Directors were pleased to announce a pending reduction in the price of gas in East Grinstead from 4s. to 3s. 10d. per 1000 cubic feet; and he thought he could say with confidence that there was no town that would compare with it for size and the cost of the carriage of the coal from the collieries, which must be borne in mind, where gas was supplied so cheaply as this. They proposed to reduce the charge at Forest Row by 6d. per 1000 cubic feet, and trusted this would stimulate consumption in that place. The Chairman moved the adoption of the report and accounts; and the motion was unanimously agreed to. Among the complimentary votes was one to the Secretary and officers, which was acknowledged by the Secretary (Mr. E. A. Head), the Gas Engineer (Mr. D. T. Livesey), and the Water Manager (Mr. R. G. Payne). So far as the gas portion of the undertaking is concerned, Mr. Livesey has reason to be gratified at the progress made during his eleven years' management. The consumption has increased 150 per cent.; the price has been reduced 6d. per 1000 cubic feet; the dividends have risen from £6 and £4 4s. to £9 and £6 6s. respectively; and the balance to be carried forward is upwards of £1400.

A Year of Ups and Downs at Elland.

At the annual meeting of the Elland-cum-Greetland Gas Company on the 24th ult., the Chairman (the Rev. G. E. Aspinall), moving the adoption of the report and accounts, reviewed the financial condition of the Company. He said £781 had been spent on a plant for the manufacture of sulphate of ammonia, but nothing on new buildings, as the east end of the old retort-house had been utilized, and the adaptation of the building had been provided for out of revenue. Turning to the revenue account, he said the cost of coal and its transit showed a reduction of £677, which was partly due to the price being slightly less, and also to less coal having been carbonized. The yield of gas per ton had been 11,093 cubic feet, against 10,644 cubic feet for the preceding year. The income showed a considerable decrease. Sales of gas were £1825 less in amount, and consumption showed a reduction of 2,985,600 cubic feet, being at the rate of 2·6 per cent. Analyzing this decrease, they found that the consumption for trade purposes had dropped by 4·6 per cent., and that for public lighting 10·5 per cent.; whereas there was a satisfactory increase on the prepayment meter business of 17·35 per cent. The reason for the decrease might be said to be bad trade, and consequent economizing on the part of the Railway Company and public authorities in lighting, coupled with a largely extended use of incandescent lighting, which, when substituted for open-flame lighting, meant a reduction of about one-third in the use of gas. Another reason was the fact of a local firm of engineers making their own producer gas for power purposes, in substitution of the Company's, which alone accounted for the loss of 4,106,800 cubic feet. A further reason was the fact that the price of gas was reduced on the 1st of January last year by 3d. per 1000 cubic feet, which meant a concession to the consumers of at least £1450. The year showed a steady, if not a great, increase in the output of meters and cookers, from which, when times mended, the Directors anticipated satisfactory results. The residuals showed only a poor return. They were responsible for a reduction of £651 in revenue, owing chiefly to the reduced value of coke and tar, which he regretted did not show signs of improvement in price. The net balance available for distribution was £5354, against £4979 for the preceding year. This enabled them to pay the prescribed dividend on the preference shares, the maximum 5 per cent. on the stock, and a dividend on the ordinary sliding-scale stock which with the 5 per cent. interim dividend paid last June made 7¼ per cent., against 6⅝ per cent. for the year 1903. The motion was carried. Thanks to the Chairman and other Directors, the Engineer and Manager (Mr. Robert Porter), and the staff, concluded the meeting.

An Interesting Comparison at Enfield.

The accounts presented at the half-yearly general meeting of the Enfield Gas Company last Tuesday showed that the gross profit realized on the six months ending December last was £4257, compared with £3908 in the corresponding period of 1903. The net profit was £3708; and the Directors recommended the payment of a dividend at the rate of 5 per cent. per annum on the preference stock, and at the rate of 5½ per cent. per annum on the ordinary stock, less income-tax. The amount required for this would absorb £3297; so that £410 of the profit resulting from the half-year's operations would remain to be added to the undivided profits brought into the account, and raise this fund to £3137. The quantity of gas sold was 74,205,400 cubic feet, against 67,565,800 cubic feet in the corresponding period of 1903; the increase being 6,639,600 cubic feet, or 9·82 per cent. The Chairman (Sir Alfred Somerset, K.C.B.) moved the adoption of the report. Mr. A. L. Ford seconded the motion, and drew attention to the growth of the gas-rental, which, though the price per 1000 cubic feet had been reduced by 2d. since the 1st of October, 1904, was £830 more than in the corresponding half of the preceding year. He informed the meeting that during the period under consideration the consumers of all classes had increased by 623 (559 being additional users of prepayment meters), and that the increased number of cookers installed was 677. The motion was agreed to. The thanks of the meeting having been accorded to the Directors and officers, the Secretary and General Manager (Mr. C. W. Offord), when acknowledging the vote on behalf of the latter, exhibited, at the request of the Chairman, a diagram showing the growth in the quantity of gas sold, side by side with the capital employed year by year from and including 1883 to that just closed. As further illustrating the advance of the Company's affairs and the improved position of the undertaking, he said the capital expended at the end of the year 1892 was £1382 per million cubic feet of gas sold in that year; at the end of 1902, it was £973 per million; and at the end of 1904, £927. Comparing the relationship in another way, the gas sold per £1000 of capital employed was 723,513 cubic feet in 1892, 1,040,056 feet in 1902, and 1,078,280 feet in 1904.

Increased Sale and Reduced Price at Exeter.

At the annual meeting of the Exeter Gas Company on Monday last week, Mr. G. H. Harris occupied the chair, in succession to Mr. R. T. Campion, who had filled the position for six years. He moved the adoption of the report, in which the Directors congratulated the shareholders on the continued prosperity of the undertaking. The sale of gas during the past year had increased by nearly 8 million cubic feet, and the amount realized from the residual products continued very satisfactory. The Board recommended a dividend of 10 per cent. on the £40,000 of ordinary stock and 7 per cent. per annum on the new ordinary shares, and that the balance should be added to the reserve fund. The Directors called attention to the fact that the appeals to Quarter Sessions against the rating valuations made by the Unions of Exeter and St. Thomas had resulted in the reduction of the rateable value of the Company's undertaking from £8314 to £6171, effecting an annual saving of £650. It had been decided to reduce the price of gas for the year 1905 to ordinary consumers from 3s. to 2s. 11d. per 1000 cubic feet. The accounts accompanying the report showed that the revenue last year was £59,054, and the expenditure £47,974; leaving £11,080 to go to the profit and loss account. The balance available for distribution was £20,190. The report was adopted; and the dividends recommended were declared.

Cheaper Gas at Harrogate.

In their annual report, the Directors of the Harrogate Gas Company stated that there was an increase of 5,843,000 cubic feet in the output of gas last year. During the twelve months 5611 yards of new mains were laid, of which 972 yards replaced old and small ones. The number of additional meters fixed was 384. The fittings department did a good business; many successful installations of high power lights having been carried out. A noteworthy feature of the Company's operations was the sale during the year of 641 gas appliances, including cookers, heaters, setpots, grillers, and boiling-stoves. It had been decided to reduce the price of gas to quarterly consumers by 2d. per 1000 cubic feet as from Jan. 1; and in lieu of a reduction in price to prepayment meter users, the rentals on stoves and fittings would be abolished. The quantity of gas made was 268,054,100 cubic feet; the consumption being as follows: In public lamps, 14,838,600 feet; ordinary meters, 124,303,700 feet; gas-stove, &c., meters, 83,370,900 feet; weekly meters, 4,125,500 feet; and prepayment meters, 23,553,600 feet. The total consumption was 250,192,300 cubic feet. When moving the adoption of the report at the meeting last week, the Chairman (Mr. S. Hornby) said it afforded him much pleasure to present so favourable an account. The concessions to consumers mentioned in the report would amount to upwards of £2000, and reduced the net price of gas to from 2s. 4·05d. to 2s. 6·6d. per 1000 cubic feet, according to class and quantity consumed. The report was adopted; and the Chairman, in acknowledging a vote of thanks, complimented the officials and staff upon the excellent result of the past year's work. Mr. Harry Wilkinson, the Secretary, in reply, said the period had been one of persistent hard work on the part of all in the service of the Company.

Decreased Consumption at Ilfracombe.

Although the Ilfracombe Gas Company are in the satisfactory position of having an increasing number of customers, the output for last year was really less than in the previous twelve months. Attention was called to this fact at the meeting of shareholders last Wednesday. The Chairman (Mr. R. Lake) explained that the falling off was due to the mildness of the season and to the competition of the electric light. The number of customers had increased by 249, and 118 additional cooking-stoves were on hire. On the other hand, they had lost some very valuable hotel customers. Mr. R. M. Rowe pointed out that the consumption showed a decrease of 1,625,100 cubic feet, and the profit one of £322. As to the profit, he suggested that the Company were dividing an amount in excess of the sum earned for the year. It was explained, in answer to this, that though the net earnings came to only £1961, there was a balance of £3585 available for dividend and interest, and the amount required to pay the statutory dividends of 5 per cent. on the preference and ordinary stock as well as interest was only £1879. Mr. Rowe also complained that the Directors had not carried £300 to the reserve fund as usual. The Chairman said the fund was really loaned to the capital account. Rather than issue new capital at 5 per cent., it was more economical to utilize this money temporarily. When it was invested in Consols, it bore only 2½ per cent.; while if they had issued fresh stock they would have had to pay 5 per cent. on it. With regard to the new works which were being built at Hele, a short distance from the town, the report stated that operations were now approaching completion; and it was expected that the manufacture of gas would be begun there in April. By June next the Directors hoped to close the old works. The Chairman said it was expected that the change would lead to economy in manufacture. The extension of the mains to Combe Martin had had a satisfactory result in bringing new customers; and there was every reason to believe that it would be most beneficial to the Company.

Presentation to the Chairman at Longwood.

In response to a resolution passed last year by the shareholders of the Longwood Gas Company, the Chairman (Mr. Edward Armitage, J.P.) was at the recent annual meeting presented with a replica of his portrait in oils. Mr. Thornton, who made the presentation, said that Mr. Armitage had taken the deepest interest in the undertaking ever since he became connected with it, not only as a shareholder, but in the interests and welfare of the district in which it was located. He was quite sure that his untiring energy and devotion, which had to him been a constant and daily practice, had had much to do with the prosperity and success of the Company. It was impossible to sit under a better Chairman. Mr. Armitage occupied his position with fairness and impartiality; and he (the speaker) hoped that, though he was getting on in years, he would remain with them for some time longer. The make of gas during the past year was 96,477,200 cubic feet, or an increase of 1,975,000 feet over the previous twelve months. The leakage was a little more; but there were several broken mains through disturbances over which the Company had no control. The maximum output of gas in one day was 570,000 cubic feet; and the Company were in the happy position of being able to supply all the demands during the foggy weather which preceded Christmas. The collection from slot meters showed an increase of £335; the demand for these meters still continuing at a rapid rate. For heating purposes, 19,550,000 cubic feet, or 22 per cent. of the make, had been sold. Slot meters consumed 14,520,400 cubic feet, or 16·68 per cent.; and public lighting, 4,993,500 cubic feet, or 5·74 per cent. A dividend was declared of 2 per cent. on the ordinary stock—making, with the interim dividend, 4 per cent. for the year; and satisfaction was expressed by the Chairman at Mr. Brearley's management of the undertaking.

New Works and Business Progressing at Portsmouth.

At the half-yearly general meeting of the Portsea Island Gas Company on the 25th ult., the Directors reported that good progress had been made with the construction of the new gas-works at Hilsea. Several sections of the works were complete, and ready for operation; while contracts had been entered into for the necessary machinery and appliances, and satisfactory progress was being made with their erection. The new gasholder at Hilsea had been in use for several months, and had proved of valuable assistance; and there was every probability that the new works would be in operation during the coming summer. The accounts accompanying the report showed that the receipts amounted to £100,800, against £96,586 for the six months ending Dec. 31, 1903; while the expenditure was £81,988, compared with £78,867. The balance carried to the profit and loss account was £18,811; whereas this time last year it was £17,719. The quantity of gas made in the half year was 649,649,000 cubic feet, compared with 621,975,000 cubic feet in the corresponding period of the previous year. There was an available balance, after placing £1000 to the credit of the insurance fund, of £42,302; and the payment of full dividends was recommended—viz., 13 per cent. on the "A" and "B" shares, 12 per cent. on the "C" shares, 10 per cent. on the "D" and "E" shares, and 5 per cent. on the stock—leaving a balance of £25,870 to be carried forward. In moving the adoption of the report, the Chairman (Sir John Baker) said the Company had supplied the town from their new works, they had developed their repairing department for stoves and meters, and during the current half year they hoped to have thoroughly overhauled the whole of the departments. With reference to statements made that the Company's Rudmore works had been purchased by the Government, he could only say that they were wholly untrue. The Directors had never been approached for negotiating for the disposal of the works; and if it ever came about, the shareholders might depend upon it that they would be amply paid for them. The motion was carried unanimously.

Prospective Increase of Capital at Richmond.

Presiding at the half-yearly meeting of the Richmond Gas Company, Mr. T. J. Carless stated that it was proposed to make a further issue of capital shortly, as owing to the growth of the Company's business, the working capital had been so reduced as to necessitate their drawing upon their bankers to the extent of £6000 at the end of the year. The capital account showed an expenditure for the half year of £1688, about £1000 of this being for improved retort-settings. The demand for cooking-stoves still exhibited a healthy growth, and the slot system of supply had been extended to the whole of the Company's district. Coal cost about the same amount as in the corresponding period; and he thought they must not look for much reduction under this head, as the market had lately been inclined to harden. Mild weather had been the rule; and in Richmond, as elsewhere, the incandescent burner had played a large part in effecting economies in gas consumption. This, however, would right itself when the use of the system became, as it must some day, universal with gas lighting. Then they might look again for steady increases. The profit and loss account showed a balance sufficient to pay a dividend of 5½ per cent. This was the second year they had paid the increased dividend, with a lower price for gas; and the Directors were hoping that if residuals maintained their former prices, they might be doing something better shortly. But prices of coal and residuals so largely affected the

working of a gas company, that profits waited on both. The report was adopted, and votes of thanks were accorded to the Chairman and Directors and the Engineer (Mr. Thomas May).

An Eventful Year at South Shields.

At the annual meeting of the South Shields Gas Company last Tuesday, the Directors reported that the revenue for the past year had been £82,630, and the expenditure £61,357; leaving a profit balance of £21,273. The sum available for distribution was £11,481; and the Directors recommended the declaration of a dividend of 4 per cent. (less income-tax) for the latter half of the year, making 8 per cent. for the year, and the addition of £1004 to the reserve and insurance funds. After deducting these amounts, there would be left a balance of £2811 to be carried forward. The accounts showed a gratifying decrease of £1486 in the manufacturing expenses. The Chairman (Mr. J. F. Armstrong), in moving the adoption of the report, said the past year had been a very eventful one. The Company promoted a Bill which was strenuously opposed by the Corporation of South Shields. It cost the Company more than £4000; but it would have cost very much less if it had not been for the uncompromising opposition of the Corporation. It would considerably alter the process of gas manufacture, and give them advantages in many other ways. They would get rid of the old process of purification, and be able to keep the purity of the gas up to the required standard by using Durham coal. At the same time they hoped to manufacture gas and sell it at cheaper rates. If the consumers would only lay aside the ordinary burners and take the incandescent ones in their place, there would be a great saving in the consumption of gas, and a proportionately less cost to the consumers. Under their old Act, they were compelled to supply the public lamps at a fixed price per lamp per annum. This applied to the South Shields, Jarrow, and Hebburn districts. No matter what price labour was, or what they had to pay for coal, they were bound to supply at one uniform charge. At last this had been repealed, and the Company had now a free hand not only to deal with the price but also with the system of illumination they should adopt. Negotiations were now going on with the public authorities; and he hoped they would lead to the flat-flame burner being largely withdrawn, and incandescent burners being used in their stead. They had also obtained the insertion of a strike clause, which, he believed, was the first clause of its kind inserted in any Act of Parliament with regard to gas companies. Before the passing of the Act, if the workmen struck and laid the works idle, the Company were still bound to supply gas to the town and in factories for engines and machinery driven by it; and they were liable to an action being brought against them if they failed. But their new Act relieved them of this responsibility. It was probable, however, they would never require to bring the clause into operation, because their relations with the workmen were very cordial and satisfactory, and he hoped would long continue to be so. Taking all the advantages into account, he thought they might look to the future hopefully. They reduced the price of gas in July, 1903, by 2d. per 1000 cubic feet, and they had further lowered it 2d. as from January this year. These were large concessions to their consumers, amounting to £4000 or £5000 per annum; but the Directors firmly believed they would lead to increased sales of gas. During last year they were called upon to fix three large installations of intensified gaslight, with results which were exceedingly satisfactory. They were fitted up by their able Engineer, and compared with the electric light were a vastly superior illuminant. They had carbonized 50,220 tons of coal during the year; being an increase of 1180 tons on 1903. The expenditure in this department had been reduced £1486, which was very satisfactory. In coke there had been an increase of 1498 tons, the output being 23,780 tons; and they realized from it £468 more, though the selling prices were lower than in previous years. The tar produced amounted to 549,209 gallons, or an increase of 27,675 gallons; the price realized being £64 less. Of sulphate of ammonia they had 408 tons, being an increase of 52 tons. The additional revenue from the penny-in-the-slot meters was £3475; and the number of these meters in use was 7000. The Chairman concluded by referring to the excellent and indefatigable services of the Secretary (Mr. J. H. Penney) and Engineer (Mr. T. H. Duxbury). Alderman Smith seconded the motion, which was agreed to without comment. A dividend of 4 per cent. was declared for the half year, making 8 per cent. for the year; and a sum of £400 was voted to the Directors for their special services.

Up-to-Date Plant at Tonbridge.

The Chairman of the Tonbridge Gas Company, Mr. J. Fagg, had a good account of the works to give to the shareholders at the annual meeting. He said that the elevator for unloading the coal from barges and conveying it to the stores, and the sulphate of ammonia plant, had answered beyond their expectations, and in a short time would repay the capital outlay. The regenerative furnaces recently adopted had been so successful that the Directors had decided to complete the retort-house in the same manner. With the consumption of gas going up, it would be necessary to telescope the gasholder, to provide more storage. A dividend of 11½ per cent. per annum on the "A" stock, 8½ per cent. an the "B," "D," and "E" stocks, and 5 per cent. on the "C" stock was declared; and the Chairman pointed out that the last reduction of 2d. per 1000 cubic feet in the price of gas would allow of the declaration in future of an extra ½ per cent. in the rate of dividend. The Secretary and Manager (Mr. J. Donaldson) was thanked for his services.

Rising Consumption and Falling Price at Tunbridge Wells.

Alderman W. H. Delves, J.P., the Chairman of the Tunbridge Wells Gas Company, announced at the annual meeting last week that the increased sale of gas—3 per cent.—had brought in an additional revenue to the extent of £970. Residual products had not been so profitable as in 1903, in spite of the fact that they had carbonized considerably more coal. Their make of coke—11½ cwt. per ton of coal—was extraordinary, and was due to the efficient furnaces, and the constant care shown by the Engineer (Mr. Andrew Dougall). The residuals, taken together, did not produce so much per ton of coal as in 1903, by about 8d.; but as the coal was 3d. per ton cheaper, the net loss was 5d. The whole result was that they showed a profit on the year's working of £14,902, which would enable them to pay all fixed charges and the dividends on the respective stocks, and leave a balance to carry forward of £2150. Under these circumstances, the Directors had no hesitation in reducing the price of gas from Christmas last by 2d. per 1000 cubic feet. This might not seem very much; but taking last year's figures, it would mean a loss to the Company of £2140, which was an acceptable sum to be left in the consumers' pockets. So far as they could see, there was no doubt that next year they would not only be able to pay the same dividends as on this occasion, but also the increased dividend of ½ per cent., to which they were entitled under the sliding-scale. As showing how completely the shareholders and consumers were in partnership to the advantage of the customers, the latter would have to pay £2140 less, and the shareholders would get about £605 more. To illustrate how the Company's business had increased in twenty years, he might mention that in 1885 the gas sold was 111 million feet; and in 1904, 260 millions. In the former year, the price charged was 3s. 9d. per 1000 cubic feet; while last year it was 3s. In 1885, the capital per ton of coal used was £9 7s. 9d.; while last year it was £6 11s. 9d. The effect of this was that the dividend required from each 1000 feet of gas was 1s. 5d. in 1885, and 11½d. last year. This gave them some idea of the influence of the increased business upon the cost of manufacture, and how much it was in favour of the consumer, as well as the shareholder.

Success of the Prepayment System at Watford.

From statements that were made at the recent half-yearly meeting of the Watford Gas Company, it would seem that both shareholders and consumers have every reason to be satisfied. In moving the adoption of the report, the Chairman (Mr. E. J. Slinn) pointed out that they had reduced the charge for gas to 2s. 10d. per 1000 cubic feet, or 1s. 5d. less than their standard price. This meant upon the quarter something like £500 in the pockets of the consumers. The reduction in price entitled stockholders to an increased dividend; and the Directors proposed to pay 13⅓ per cent. on the "A" stock and 10½ per cent. on the "B" and "C" stocks. This seemed a large dividend; but when they came to consider that something like £49,000 of stock had been sold at a premium of £23,000, it brought the dividend down considerably, and instead of 13⅓ and 10½ per cent., it was more like 7⅓ and 5¼ per cent.—at least to all those who bought the stock in modern times. Mr. H. E. Jones, the Company's Engineer, seconding a vote of thanks to the Board, said that the Company had a history which showed that very great care had been exercised on the part of the Directors in the expenditure of capital. They had also shown an extreme breadth of view and liberality in placing conveniences and facilities for gas supply before the humblest people of the town. He thought it was almost a record that in Watford there were actually at the present moment close upon 4000 slot consumers, as against 2184 ordinary ones. There was, further, this point to consider—that they now spent as much in taking the gas into the consumer's house as previously they spent in merely bringing it to his door. The history of the Company was positively unique; and the fact that the Directors had economized the capital in the face of the large number of prepayment consumers ought to reflect the greatest credit upon them.

Prosperous Past and Hopeful Future at Weymouth.

At the recent half-yearly meeting of the Weymouth Gas Company, the Directors reported that the result of the past six months' working had been of a satisfactory nature, the accounts showing that the sale of gas during this period exceeded the quantity sold in the corresponding half of 1903 by 2,603,900 cubic feet, or equal to 5·2 per cent. Notwithstanding the reduction in the price of gas from 3s. 6d. to 3s. 4d. per 1000 cubic feet, which took effect on Oct. 1, the gas-rental showed a slight increase. The returns from coke were substantially higher, and those from the other residuals (tar and ammonia) had been more than maintained. A profit of £2981 appeared upon the revenue account, out of which the interest on the 3½ per cent. perpetual debenture stock had been paid; and the Directors recommended the declaration of a dividend for the half year on the ordinary stock at the maximum rate of 5 per cent. per annum, less income-tax. The Chairman (Mr. J. E. Robens), in moving the adoption of the report, stated that, notwithstanding the introduction of the electric light by the Corporation during last quarter, the Company made on the six months 2½ million cubic feet more gas. The Directors were not in the least frightened by the electric light. The revenue from the public lamps had only been 2½d. per lamp per day; so that what might have seemed a somewhat large revenue was not, after all, a very serious consideration to the shareholders in losing the business. Since they last met, additions had been made to the number of ordinary meters, slot meters, and cookers. In June, 1904, there were 1513 ordinary meters out, and at the end of last December 1550; so that the increase amounted to 37. At the commencement of June they had 706 slot meters; and at the close of the year 816—an increase of 110. Of cookers there were 412, and they had added 26, making a total of 438. Since December last, the Company had added 90 slot meters to those already mentioned; so that it would be observed they were by no means losing ground on the score of the electric light, with which he thought incandescent gas would bear favourable comparison, both as an illuminant and in the matter of expense. He announced with pleasure that the Company had concluded the reconstruction of the works, which had been brought up from a capacity of 70 millions to 98¾ millions. For the alterations and improvements which had been carried out they owed very much to Mr. James Lowe, their late Manager, who had superintended the work, for which the Company were exceedingly grateful. The pecuniary advantages which had ensued were due entirely to the changes which had been effected during his administration. The Directors had reduced by more than £1500 the amount the consumers had formerly had to pay for their gas, and had £8000 in the reserve fund. The report was adopted, and the dividend recommended was declared. Mr. C. Bown proposed a vote of thanks to the Chairman, the Directors, and Engineer (Mr. D. F. Colson), and the Secretary (Mr. E. Y. Wood). He said the shareholders had parted with a very old friend (Mr. Lowe) with great regret; but in his place they had a younger Manager, and, so far as present experience went, they were fully satisfied with their choice. Mr. Colson was a worthy son of a worthy father. He had enjoyed the

privilege of having been brought up by one who occupied one of the highest positions in the gas industry, and had had for a school one of the largest undertakings in the Provinces. The Company were now receiving benefits derived from that training and experience, as well as the power of youth and energy coupled with scientific knowledge. Mr. Colson expressed his gratification at being present at the meeting, which was his first, and said he thought the shareholders need not fear for the future of the Company, because where there was competition it tended to smarten them up, and the consequence would be a still larger consumption of gas. Mr. Wood also acknowledged the vote.

Water.

Extensions at Newcastle.

Considerable capital expenditure on new works is being incurred by the Newcastle and Gateshead Water Company; the outlay under this head last year having amounted to £146,000, though this was less than in the preceding twelve months by £81,000. The Chairman (Mr. W. D. Cruddas) explained at the annual meeting that the Catcleugh reservoir, with the exception of the gauge-house and the clearing up, had been completed. It had impounded water within 32 feet of the top water-level, and at the moment contained about one-third of its full capacity. The reservoir had proved to be perfectly water-tight and thoroughly satisfactory. Another work was the Whittington tunnel, 3 miles in length; and a third was the new aqueduct from the Pont sluices to Whittle Dene, for conveying larger quantities of water from the Hallington reservoir to Whittle Dene, and thence to Newcastle. These were newly finished, and could almost immediately be brought into full use. The crossing of the Ouseburn, on the way to the Byker reservoir, remained; and the delay was due to difficulties with the Corporation in connection with the Quayside alterations. It is hoped that no other large works will have to be taken in hand for some years to come. Though the Company have not had to restrict the supply of water, the dryness of the past year and the beginning of this has caused considerable anxiety. The Chairman pointed out that the rainfall from May to October was 10 inches; and from October to Feb. 1 it was only 5·38 inches, being less than in any corresponding period for 25 years. This year was commencing very badly. There had been a drought since Jan. 1; only 1¼ inches of rain having fallen at Whittle Dene. The report (which was adopted) showed that the total receipts of the year amounted to £174,166, compared with £168,931, or an increase of £5234. This increase consisted of £2934 on domestic rental, and £2763 on manufacturing account, including water supplied for public purposes, and a balance of £76 upon miscellaneous receipts. The Chairman remarked that the increase in the manufacturing revenue was satisfactory, because it followed on a decrease the previous year of £1270; while the increase in the domestic revenue was £702 less than the increase in the preceding twelve months. This was accounted by the less rapid increase in new supplies and in building going on in the city. The balance of profit carried to dividend and interest account was £136,172 (as against £131,000), making, with the balance brought forward, a total of £137,368. The dividend for the year on the original stock was £7 12s. 6d., and on the 1876 and 1898 ordinary stock £5 6s. 9d.

Payment on Account of Back-Dividends at Sutton.

In accordance with the recommendation of the Directors, the shareholders of the Sutton District Water Company will receive for the past half year a dividend at the rate of 10 per cent. per annum (less income-tax) upon the ordinary capital, *plus* ½ per cent. on account of back-dividends. In addition to this, £1000 is to be carried to reserve, and there will be a balance of £3394 to be carried to the next accounts. For the first two years of the Company's existence, no dividend at all was paid; and in the third year there was only a small distribution. In all, the dividend arrears are stated to amount to something like £36,000. The report of the Directors showed that the capital expended during the past half year was £5772. The gross revenue showed an increase of £639, and the expenses of £506, as compared with the corresponding period of 1903. The balance of profit, including £2012 brought from the previous half year, after providing for the interest on debenture stock and loans and the dividend on the preference stock, amounted to £7394. With regard to the payment of back-dividends, it may be remembered that this matter was brought forward at the previous meeting by Mr. Alexander Dickson, who suggested that it would be better to do this than to pay the full dividends free of income-tax as the Directors were then doing, notwithstanding the decision in the Ashton case, to which Mr. Dickson had called their attention in a letter to the Chairman. He, however, was treated somewhat discourteously over the matter; for not only was his letter not acknowledged, but he was snubbed at the meeting, as well as by a sapient scribe in a local paper, for having the temerity to make so ridiculous a proposal "The Company had always paid the income-tax," said the Chairman, "and should continue to do it until they were stopped;" while the local Solon scoffed at Mr. Dickson—the former Secretary of one of the London Water Companies—as a man who "hailed from Deptford," and had the audacity to come to the more refined neighbourhood of Sutton to make an "unheard-of suggestion." Yet this insignificant Deptford man has succeeded in bringing the Directors to reason; for in their report they confessed that in deciding to pay the dividend less income-tax they had been "influenced by the decision of the Court of Appeal in the case of the *Attorney-General v. Ashton-under-Lyne Gas Company*," which made it doubtful if "the payment of the maximum dividend free of income-tax was not *ultra vires*." The Chairman also admitted this in his speech; and it would only have been just to have acknowledged the source of the influence. The effect of the change, the advisability of which the Board have at last succeeded in appreciating, has been to enhance the value of the proprietors' holdings, as a dividend of 10½ per cent. commands a better selling value than one of 10 per cent. free of income-tax. But even now, while the Directors retain the income-tax on the 10 per cent., they do not deduct it on the extra ½ per cent. So that the proprietors are to be troubled to return this in their statement to the Surveyor of Taxes, while the main amount is paid through the Company!

FAIR WAGES CLAUSE AT MANCHESTER.

A deputation representing the Amalgamated Society of Engineers recently waited on the Manchester Gas Committee, for the purpose of arguing that the contract for the installation of inclined retorts at the Gaythorn works is not being carried out in accordance with the fair contracts clause of the Corporation. They urged that the stipulated penalty of £100 should be enforced.

When moving the adoption of the Committee's report by the City Council last week, Alderman Gibson referred to the matter, and remarked that, so far as he was concerned, it was a difficult matter to say who was to enforce the penalty. He had had an interview with the firm in question; and they said the statements made were not in accordance with the facts. They claimed that they did act up to the standing regulations, and challenged any one to disprove it. Under the circumstances, he urged that the onus of proving their case rested with those who had made the charge. Mr. Johnston moved an amendment that the portion of the report relating to this matter be referred back, with an instruction that the representatives of the firm and of the Engineers' Society should meet before the Committee. He stated that he had received a letter from the Society saying that the charges they had made they were prepared to prove. It was therefore the duty of the Committee to interview the men and the firm and find out the truth. The amendment was carried.

GAS-FITTERS' DISPUTE AT ROTHERHAM.

The gas-fitters in the employ of the Rotherham Corporation have been asking for an increase of wages; but as the result of an interview between a deputation of the men and the Chairman and Vice-Chairman of the Gas Committee and the Engineer (Mr. F. A. Winstanley), the Committee decided that the application should not be acceded to.

When the report came before the Council for adoption, Mr. Grundy asked what were the reasons for the dismissal of the two men who had formed the deputation. Alderman Gummer replied that there was no possible connection between the deputation and the dismissal of the two men, which was on account of bad work. Mr. Grundy thereupon moved that the report be struck out, and a clause inserted that a Committee be chosen to inquire into the dispute with the employees and the general management of the gas-works. This was, however, withdrawn on Alderman Gummer stating his willingness, before the dismissal should be considered final, to have further inquiry made. The Alderman then gave the reasons which had led to the decision that the application for the advance of wages should not be acceded to. The men, he said, were paid 27s. to commence with, rising to 30s. and 32s., according to merit, for 48 hours per week. In Sheffield, the gas-fitters received 22s.; the maximum being 36s. for length of service and merit. They considered that, as the Rotherham men started at 27s. per week, as compared with 22s. in Sheffield, they were not suffering any injustice at present.

GAS PURIFICATION AT COVENTRY.

No Lime to be Employed at Foleshill.

At the Meeting of the Coventry City Council last Tuesday, a report of the Gas Committee on the subject of the system of purification to be adopted at the new works at Foleshill, to which reference was made in the "JOURNAL" last week, was submitted. The Committee stated that they had considered a report on the subject from their Engineer and Manager (Mr. Fletcher W. Stevenson), who had been supported by Sir George Livesey. At the old works, the system had been purification by lime; but for Foleshill Mr. Stevenson advocated purification by oxide of iron, which was apparently equally efficacious with lime in removing all the sulphuretted hydrogen from the gas, but did not remove any appreciable quantity of the other sulphur compounds. Alderman Booth, in moving the adoption of the recommendation to use oxide, said the advantages of the new system of purification included freedom from obnoxious smell, greater comfort to the workmen engaged, and complete immunity from injury to their eyes. A Board of Trade Departmental Committee had reported in its favour; and the gas would not be injurious to ribbon industry pursuits, as some people had thought. Mr. Jackson seconded the motion, and said the change had received the very serious consideration of the Committee at two meetings. Mr. Gardner inquired whether the Committee had come to the Council on this matter because they had such faith in the members' expert knowledge of chemistry. Alderman Booth explained that as the sulphur compounds shown in official tests would be greater than in the past, the Committee thought it advisable to bring the matter before the Council, so that at any future time they could not say they were not consulted upon it. Alderman Maycock asked whether £12,000 required for the plant had been provided for in the estimates, and the answer was an affirmative one. The report was adopted.

In his report, Sir George gave details of the now well-known experiments he had had carried out in two similar rooms, to try the effect of burning in one of them gas in which the sulphur compounds were reduced by lime purification to about 12 grains per 100 cubic feet, while the other was supplied with gas purified with oxide of iron, which left the compounds at from 30 to 40 grains; and he concluded as follows: "I think the experiments are conclusive on the point raised, and that a very prevalent idea in Coventry that the sulphur in gas is detrimental in the weaving of silk is a mistake, and entirely without foundation. If, as I am convinced is the case, the infinitesimal quantity of sulphur compounds left in the gas when oxide is the purifying agent does no harm whatever in the air where gas is

burnt, the sooner the obnoxious process of purification by lime is given up the better. . . . I have therefore no hesitation in advising that, for the reason given by your Engineer, the new works should have oxide purification, and that lime should be abandoned at the old works in Coventry. By abolishing lime for purification, you may feel quite assured that not one of your consumers will be hurt or injured in any way, while those in the neighbourhood of the works and your workmen will benefit by the abandonment of a process that is, and always has been, a nuisance."

ACCIDENTS IN GAS-WORKS.

Suggestions by Mr. Harrison Veevers for their Avoidance.

In view of the accidents which have lately taken place in gas-works, and of the remarks therein contained in the article in the "JOURNAL" on the 24th of January last, Mr. Harrison Veevers, the Gas Engineer, Manager, and Secretary to the Dukinfield Corporation, has deemed it advisable to address the Gas Committee on the subject, so as to avoid or palliate the effects of these disasters in future. As some of the members might be inexperienced in the method of making gas, he first of all briefly explains how explosions or fires are caused. He points out that coal gas when generated requires instant removal from the retort; and if from any cause the flow of gas is arrested, the gas must seek an outlet. He goes on to say that the most serious accidents by explosions have occurred in the purifier and governor houses. The mere escape of gas may be only so much waste; but if by coming in contact with air and with a flame, in or near the building, an explosion is sure to follow, with certain loss of life or of property. It is sometimes difficult to say where the gas in such accidents takes fire. Sometimes it is through a light in the building itself, at others owing to the wind carrying the gas to an outside lamp, or to a fire in a retort-house or smithy. Mr. Veevers at the Dukinfield Gas-Works advises that the syphon-box in the scrubber-washer room should be covered by an inverted cone, ending in a 6-inch pipe carried through the roof of the shed, and raised sufficiently high for the gas to escape in safety. A warning whistle could be attached to give an alarm. In the purifier-house, no light, as at present, should be allowed, as the work required can be done by daylight. In the governor-house no light should be allowed; but as the room is used as much by night as by day, a powerful lamp with a couple of incandescent burners might be planted about 50 yards off, which would, he says, give enough light through the windows and glazed doors to enable the man in charge to do his work. An ample ventilator should also be provided on the top of this, as well as of the meter-house, both of which are one-storey buildings. He points out that the expense of these alterations would be trifling in comparison with the cost of damage caused by even one explosion.

Belfast City Council and the Gas Profits.—In reply to a deputation from the Finance Committee of the Belfast City Council, the Gas Committee have expressed their willingness to set aside a sum of £15,000 out of the gas profits in relief of the rates for the year 1905, the same as was done last year. In addition, they will pay £1000 towards the improvement of the Victoria Park, in compliance with a request made to them some time ago.

METROPOLITAN WATER BOARD.

The Fortnightly Meeting of the Board was held on Friday—Sir R. M. BEACHCROFT in the chair.

The General Purposes Committee presented a report with reference to the salary of Mr. F. E. Harris, the Comptroller to the Board. Mr. Harris was appointed Accountant on Jan. 22, 1904, at a commencing salary of £1000 per annum, and in October last his title was altered to that of Comptroller. Acting on the suggestion of the Finance Committee, the General Purposes Committee recommended that his salary should be increased to £1250 a year as from April 1 next. After some discussion, the increase was approved by 26 votes to 14.

The Works and Stores Committee presented a report on the subject of the examinations of water. They expressed the opinion that the time has arrived for the examinations conducted by Sir William Crookes and Sir James Dewar to be extended to the Kent district, in order to place them all on a uniform footing, thereby dispensing with the services of Professor Percy Frankland; and they recommended that this should be done as from the 24th of June next. This was agreed to. The Committee were authorized to incur further capital expenditure to the amount of £166,098 up to the 31st inst. Statistics submitted by the Committee showed that in the month of January the Board supplied 209,655,000 gallons of water to an estimated population of 6,722,792. The mean supply per head per day was 31·2 gallons, compared with 30·8 gallons in January, 1904. There were 3824 million gallons of water in store in impounding reservoirs, exclusive of 3078 millions in those at Staines. No fewer than 1064 new supplies were laid on, and the length of new mains was 4650 yards. The total number of fires was 370; of which 108 were in the Southwark and Vauxhall district, and 77, 67, and 59 in the New River, West Middlesex, and East London districts.

Saltash Water Supply.—Attention has of late been again directed to the question of the water supply of Saltash. At present the town is served by the Plymouth Corporation through a main laid across the bed of the River Tamar, close to the Great Western Railway bridge. When the agreement for this supply was entered into, it was made for fifteen years, of which eight have still to run. The subject has now been revived in consequence of the promotion of the Torpoint Water Bill. The Torpoint District Council are anxious to include Saltash in their district of supply; and the Saltash Town Council have petitioned against the Bill. In the meantime, an effort is being made by the Saltash Corporation to ascertain how they will stand when the present agreement with the Plymouth Corporation expires. Interviews took place recently between representatives of the Saltash Corporation and the Water Committee of the Plymouth Corporation, with the object of ascertaining the position in which the two bodies are likely to be placed on the termination of the agreement. As the result of these conferences, the Water Committee have laid before the Saltash authority the terms and conditions on which the supply can be continued when the eight years have transpired. Plymouth offers to make a new agreement for a term of thirty years, at the price of 6d. per 1000 gallons, compared with 4d. now charged. This will mean an addition of about £1000 to the cost of the supply for the eight years during which the present agreement has to run; but Saltash is disposed to accept these terms rather than risk having to pay more when the agreement expires.

GAS COMPANIES' STOCK AND SHARE LIST.

Referred to on p. 631.

Issue.	Share.	When Dividend.	Dividend or Dividend & Bonus.	NAME.	Closing Prices.	Rise or Fall in Wk.	Yield upon Investment.
£			p.c.				£ s. d.
590,000	10	Oct. 13	10½	Alliance & Dublin 10 p.c.	21—22	..	4 15 5
100,000	10	,,	7½	Do. 7 p.c.	14½—15½	..	4 16 9
200,000	5	Nov. 11	6½	Bombay, Ltd.	6½—6¾	..	4 16 4
140,000	5	,,	6½	Do. New, £4 paid	4⅜—5⅛	..	4 19 1
50,000	10	Aug. 31	14	Bourne- } 10 p.c.	29½—30½	+½	4 11 10
251,810	10	,,	7	mouth Gas } B 7 p.c.	16½—17½	+½	4 0 0
53,200	10	,,	6	and Water } Pref. 6 p.c.	14½—15½	..	3 17 5
380,000	Stk.	Feb. 24	12	Brentford Consolidated	245 - 250*	..	4 16 0
300,000	,,	,,	9	Do. New	18 - 190*	..	4 14 9
50,000	,,	,,	5	Do. 5 p.c. Pref.	127—132*	..	3 15 9
206,250	,,	Dec. 15	4	Do. 4 p.c. Deb.	105—108	..	3 14 1
220,000	Stk.	Sept. 15	11	Brighton & Hove Orig.	228—233	..	4 14 5
246,320	,,	,,	8	Do. A. Ord. Stk.	168—173	..	4 12 6
460,000	20	Sept. 29	10	British	41—42	..	4 15 3
100,000	Stk.	Feb. 24	6	Bromley, Ord. 5 p.c.	114—119*	..	5 0 10
165,700	,,	,,	4½	Do. do. 3½ p.c.	90—94*	..	4 15 9
500,000	10	Oct. 13	7	Buenos Ayres (New) Ltd.	12—12¾	+¼	5 12 0
250,000	Stk.	Dec. 30	4	Do. 4 p.c. Deb.	94—96	..	4 3 4
150,000	20	July 14	8½	Cagliari, Ltd.	25—27	+1	6 2 3
100,020	10	Sept. 29	10	Cape Town & Dis., Ltd.	16½—17	..	5 17 8
100,000	10	Oct. 27	4½	Do. 4½ p c Pref.	9½—10	..	4 10 0
50,000	50	Nov. 2	6	Do. 6 p.c. 1st Mort.	52—54	..	5 11 1
50,000	Stk.	Dec. 30	4½	Do. 4½ p.c. Deb. Stk	100—102	..	4 8 3
1,400,000	Stk.	Feb. 24	5⅛	Commercial 4 p c Stk.	116—119*	+1	4 7 4
560,000	,,	,,	5	Do. 3½ p.c. do.	112—115*	+1	4 6 11
450,000	,,	Dec. 15	3	Do. 3 p.c. Deb. Stk.	86—88	..	3 8 2
800,000	Stk.	,,	6½	Continental Union, Ltd.	117—120	..	5 8 4
200,000	,,	,,	7	Do. 7 p c. Pref.	140—145	..	4 16 7
424,070	Stk.	Feb. 18	5½	Derby Con. Stk.	—	..	—
55,000	,,	Jan. 3	4	Do. Deb. Stk.	108—110	..	3 12 9
486,090	10	Jan. 27	11	European, Ltd.	21—22	..	5 0 0
354,060	10	,,	11	Do. £7 10s. paid	14½—15½	..	5 6 6
15,243,200	Stk.	Feb. 10	4⅛	Gas- } 4 p.c. Ord.	99—101	..	4 7 1
2,600,000	,,	,,	3½	light } 3½ p.c. max.	92—94	..	3 14 6
3,799,735	,,	,,	4	and } 4 p.c. Con. Pref.	112—114	..	3 10 2
4,193,975	,,	Dec. 15	3	Coke } 3 p.c Con. Deb.	89—91	..	3 5 11
258,740	Stk.	Sept. 15	5	Hastings & St. L. 3½ p.c.	100—103	..	4 17 1
70,000	10	Sept. 29	11	Hongkong & China, Ltd.	16—17	..	6 9 5
3,800,000	Stk,	Nov. 11	10	Imperial Continental	213—215	+1	4 13 0
473,600	Stk.	Feb. 10	3½	Do. 3½ p.c. Deb. Red.	96—98	..	3 11 5
175,036	Stk.	Aug. 31	6	Lea Bridge Ord. 5 p.c.	118—123	..	4 17 7
561,000	Stk.	Feb. 24	10	Liverpool United A	219—221*	..	4 10 6
718,100	,,	,,	7	Do. do. B	159½—161½*	..	4 6 8
306,083	Stk.	Dec. 30	4	L'rpool Unit'd Deb. Stk.	107—109	..	3 13 5
75,000	5	Dec. 15	5	Malta & Medn., Ltd.	4—4½	..	5 11 1
560,000	100	Oct. 1	5	Met. of } 5 p.c. Deb.	103—105	..	4 15 3
250,000	100	,,	4½	Melbourne } 4½ p.c. Deb.	103—105	+1	4 5 9
541,920	20	Nov. 11	3⅜	Monte Video, Ltd.	10⅜—11½	..	6 1 9
1,565,892	Stk.	Feb. 24	4⅝	Newc'tle & G'tesh'd Con.	106-107*	+¼	4 6 5
406,c25	Stk.	Dec. 30	3½	Do. 3½ p.c. Deb.	91—92	..	3 16 1
15,000	10	Feb. 24	10	North Middlesex 10 p.c.	19—20*	..	5 0 0
52,940	1	,,	7	Do. 7 p.c.	13—14*	..	5 0 0
300,000	Stk.	Nov. 30	8	Oriental, Ltd.	148—151	..	5 6 0
600,000	5	Sept. 15	7	Ottoman, Ltd.	5¾—6¾	..	5 12 0
235,005	Stk.	—	6¾	Plym'th & St'house 5 p.c.	—	..	—
398,490	5	Apl. 28	5	Primitiva Ord.	5¾—6¼	+¼	4 0 0
796,980	5	Jan. 27	5	Do. 5 p.c. Pref.	4¾—5¼	..	4 15 3
488,900	100	Dec. 1	4	Do. 4 p.c. Deb.	95—97	+1	4 2 6
851,070	10	Oct. 13	7	River Plate Ord.	12½—13	+¼	5 7 8
300,000	Stk.	Dec. 30	4	Do. 4 p.c. Deb.	95—97	+1	4 2 6
250,000	10	Sept. 15	7†	San Paulo, Ltd.	12—12½	..	5 12 0
70,020	50	Jan. 3	5	Do. 5 p.c. Deb.	52—54	..	4 12 7
135,c00	Stk.	Sept. 15	10	Sheffield A	238—240	..	4 3 4
209,984	,,	,,	10	Do. B	237—239	..	4 3 8
523,498	,,	,,	10	Do. C	236—238	..	4 4 0
123,998	Stk.	Sept. 29	5	Shrewsbury Ord. 5 p.c.	104½—107½	..	4 13 0
70,000	10	,,	11	South African	16—17	..	6 9 5
6,250,c00	Stk.	Feb. 10	5⅛	South Met., 4 p.c. Ord.	128—130	+1	4 4 7
1,832,700	,,	Jan. 13	3	Do. 3 p.c. Deb.	89—91	..	3 5 11
575,0 0	Stk.	Feb. 24	5⅛	S'th Suburb'n Ord. 5 p.c.	120—123*	..	4 9 5
60,000	,,	,,	5	Do. 5 p.c. Pref.	122—127*	..	3 18 9
112,533	,,	Jan. 13	5	Do. 5 p c. Deb. Stk.	130—135	..	3 14 1
502,310	Stk.	Nov. 11	5	Southampton Ord.	106—109	..	4 11 9
87,950	,,	—	4	Do. 4 p.c. Deb.	—	..	—
120,000	Stk.	Feb. 24	6¾	Tottenham } A 5 p.c.	122—127*	..	4 18 5
338,c20	,,	,,	4¾	and } B 3½ p.c.	95—100*	..	4 15 0
125,000	,,	Dec. 15	4	Edmonton } 4 p.c. Deb.	105—108	..	3 14 1
182,380	10	,,	8	Tuscan, Ltd.	9½—:0	+½	8 0 0
149,900	10	Jan. 3	5	Do. 5 p c. Deb. Red.	97—100	..	5 0 0
30,000	Stk.	Feb. 24	7½	Wands- } A 5 p.c.	157—162*	..	4 15 8
255,636	,,	,,	6¾	worth } B 3½ p.c.	130—135*	..	4 12 7
60,c00	,,	,,	5⅝	and } C 3½ p.c.	108—110*	..	4 18 7
57,564	,,	Dec. 30	3	Putney } 3 p.c. Deb. Stk.	77—82	..	5 13 2
745,872	,,	Aug. 12	5	West Ham 5 p.c. Ord.	104—106	..	4 14 4
185,000	,,	,,	5	Do. 5 p.c. Pref.	125—128	..	3 18 2
193,300	,,	Dec. 30	4	Do. 4 p.c. Deb. Stk.	105—110	..	3 12 9

Prices marked * are Ex div. † Next dividend will be at this rate.

LINCOLN CORPORATION WATER SUPPLY.

The Typhoid Epidemic—Auxiliary Supplies.

Owing to the prevalence of typhoid fever in Lincoln, to which reference has already been made, steps have been taken by the Corporation, under the advice of members of the medical staff of the Local Government Board, to apply chemical treatment to the water before passing into the filter-beds. The treatment commenced on the 11th ult. at the works. The Cross Cliff Hill reservoir was treated with minute doses of the chemical on several days, and the Westgate reservoir on other days. During the progress of the treatment, tests were applied, usually at hourly intervals, night and day, to the water which was being sent out; the tests used being of such delicacy that one part of the sterilizing agent in 10 million parts of the water could readily be detected. The results indicated that either none of the material used was reaching the consumers, or in an amount so infinitesimal as to be absolutely harmless. The treatment has been so successful that it is proposed progressively to diminish the quantity in use. The expert chemists and bacteriologists retained by the Corporation have been constantly at the works, and carried out daily, usually hourly, analyses of the water supplied. The total number of cases of fever notified up to the end of the past week was nearly 800.

The outbreak of the epidemic has led the Corporation to search for temporary supplies of water from outside sources, and also to improve the existing works. From Newark, by the kindness of Alderman T. Smith, water is brought daily to Lincoln in railway engine tenders, each capable of holding 2250 gallons, placed at the disposal of the authorities by the Midland Railway Company. These are run into the siding south of the Midland Station, and attached to a horizontal pipe containing many taps. A similar arrangement is now in operation in the higher part of the city, only the conveying media are specially prepared street-watering carts with taps arranged at intervals. These are each of a capacity of 450 gallons, and are distributed about the upper districts, so that people may fetch the water in similar manner to those utilizing the railway station. The people help themselves freely. In addition to this, Mr. Sharpley Bainbridge, J.P., made a generous offer which resulted in exactly doubling the quantity of water furnished by Alderman Smith. Mr. Bainbridge agreed to supply, free of charge, 10,000 gallons of Newark water per day for a month, on condition that the Corporation would consent to distribute it to all parts of the city, including the higher districts. The offer was gratefully accepted. Water is also being brought from Gainsborough. Since the completion of the new borehole, that town can command a supply of 200,000 gallons per day in excess of the requirements; and this led the authorities to offer to supply Lincoln with 100,000 gallons per day. This offer the Lincoln Corporation accepted; and arrangements were made with the Great Northern and Great Eastern Railway Companies to act as carriers.

With regard to the permanent supply—present and future—some information which has appeared in fragmentary form is given in a concrete fashion by the "Lincolnshire Chronicle," accompanied by many additional facts. In the first place, the Special Committee appointed by the Council to deal with the question of the provision of a fresh water supply, irrespective of the present bore, decided to retain the services of Mr. G. H. Hill, M.Inst.C.E., of Manchester, as their expert Water Engineer; and all possible information—statistical and otherwise—has been given to him, so that he might at once commence the important task for which he has been chosen. This appointment has led to some misapprehension respecting the position of Mr. Percy Griffith, the Corporation's Engineer, in connection with the boring. This, however, is in no way affected. The Committee from the outset recognized the necessity of procuring a supply of water irrespective of the bore, which it is estimated, when the water is reached, will yield a million gallons a day. The bore was commenced in 1901, and had it not been for the unfortunate accident by which the boring-tool was lost in November of 1903, it would now have been very far advanced. When the tool was lost, the bore had been sunk to a depth of 882 feet; and it is supposed that the tool will be found 850 feet below the surface. To reach it a shaft is being sunk, and so well has the work advanced that it is hoped it will be recovered in the course of a fortnight. The total depth of the bore when completed is estimated at 2200 feet. At the best it cannot be hoped that this water will be reached in less than 18 months; and then there will be much to be done before it is available. Mr. Hill's work is quite independent of this, as on the estimate this bore would only supply half the quantity of water at present required, and the aim is to have more than sufficient without having to draw on the present surface supplies.

Metropolitan Gas Company of Melbourne.—The report of the Directors of this Company for the half year ended Dec. 31 shows that the net profits, including a balance of £3059 brought forward, amount to £55,000. The Directors have transferred to the reserve fund account £10,000, and to the meter renewal fund £3000; and they recommend a dividend at the rate of 4s. 6d. per share, amounting to £38,574, leaving a balance to be carried forward of £2925. An opportunity having presented itself during the half year of securing the undertaking of the Brunswick Gas-Works Company, Limited, on advantageous terms, the Directors have purchased it for £13,250.

The Neath Corporation and their Gas Stokers.—The Neath Gas Committee reported to the last meeting of the Corporation that there had been some difficulty with the stokers since their return to work on adjustment of disputes; several having been taken ill, and leaving at short notice, thus jeopardizing the public supply of lighting. The Town Clerk read letters from Mr. V. Morgan, the Secretary of the Gas Stokers' Union, regretting that a new difficulty had arisen; the men stating that the work was too hard, and impossible to get through as arranged. He said they alleged that the amount of coal put into the retorts was more than was agreed upon; but he had advised the men to loyally carry out the work as arranged. He thought it possible to come to an amicable settlement. The matter was referred to the Gas Committee.

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	Cub. Ft. Daily.		Cub. Ft. Daily.		Cub. Ft. Daily.
BLACKBURN	1,250,000	ST. CATHERINES (Remodelled)	250,000	TONBRIDGE	300,000
WINDSOR ST. WORKS, BIRMINGHAM	2,000,000	KINGSTON, PA.	125,000	STRETFORD	500,000
SALTLEY WORKS, BIRMINGHAM	2,000,000	PETERBOROUGH, ONT.	250,000	OLDBURY	300,000
COLCHESTER	300,000	WILKESBARRE, PA.	750,000	TODMORDEN	500,000
BIRKENHEAD	2,250,000	ST. CATHERINES (2nd Cont)	250,000	SALTLEY, BIRMINGHAM (Third Contract)	2,000,000
SWINDON (New Swindon Gas Co.)	120,000	BUFFALO, N.Y.	2,000,000	YORK (Second Contract)	750,000
SALTLEY, BIRMINGHAM (Second Contract)	2,000,000	WINNIPEG, MAN.	500,000	ROCHESTER (Second Contract)	500,000
WINDSOR ST., BIRMINGHAM (Second Contract)	2,000,000	COLCHESTER (Second Contract)	300,000	NEWPORT (MON.)	250,000
HALIFAX	1,000,000	YORK	750,000	TOKIO, JAPAN	1,000,000
TORONTO	250,000	ROCHESTER	500,000	PERNAMBUCO (Brazil)	125,000
OTTAWA	250,000	KINGSTON, ONT.	300,000	MALTON	150,000
LINDSAY (Remodelled)	125,000	CRYSTAL PALACE DISTRICT	2,000,000	DULUTH, MINN. (2nd Cont.)	300,000
MONTREAL	500,000	DULUTH, MINN.	300,000	BROCKVILLE (ONT.)	250,000
TORONTO (Second Contract Remodelled)	2,000,000	CATERHAM	150,000	SMETHWICK	500,000
BELLEVILLE	250,000	LEICESTER	2,000,000	GRAVESEND	300,000
OTTAWA (Second Contract)	250,000	ENSCHEDE (HOLLAND)	150,000	NEWPORT MON. (Second Contract)	250,000
BRANTFORD (Remodelled)	200,000	BUENOS AYRES (RIVER PLATE CO.)	700,000	TORONTO (Third Contract)	750,000
		BURNLEY	1,500,000	TORONTO (Fourth Contract)	1,000,000
		KINGSTON-ON-THAMES	1,750,000	MONTREAL, ONT. (2nd Cont.)	1,800,000
		ACCRINGTON	500,000	HAMILTON, ONT.	400,000

LEEDS, 1,800,000 C. Ft. LEICESTER (2nd Cont.), 1,000,000 C. Ft. NEWCASTLE-ON-TYNE, 1,800,000 C. Ft.

AND IN ADDITION, 7,000,000 CUBIC FEET DAILY; also Coal-Gas Plants at NELSON, B.C., CHATHAM, BERLIN, NAPANEE, OWEN SOUND, CALGARY, and WINNIPEG.

NOTES FROM SCOTLAND.

From Our Own Correspondent.

Saturday.

The resolution of the Town Council of Glasgow (reported in another column) to reduce the illuminating power of the gas supplied in the city claims first attention at this time. It is a step which has been taken with deliberation, for the statutory authority is four years old. That the power has not been exercised till now is, presumably, to be attributed to the fact that the Corporation were not in a position to supply the increased demand for gas which might be expected to follow, when the price is reduced. Now, when the Provan works are open, there will be no difficulty on this score for many years to come. The works in the hands of the Corporation are at present equal to any possible demand which may be made upon them; and at Provan there is not only room for an almost indefinite extension, but the first extension is already well on towards completion, so far as the retort-house is concerned. Of course, it is beyond question that the Council have been moving towards a reduction for some years, and that they required scarcely any persuasion when the time came to put their new views into practice. There has been a strong desire on the part of a section of the members to have a differential price fixed for gas used for other than lighting purposes; but the Council have not shown much favour towards such a proposal. Their desire has been to make all alike; and, if they could give relief, that they should do it all round by the reduction of the price of gas. The extent they have hitherto gone has been to sell gas for motive power purposes 1d. per 1000 cubic feet cheaper than for lighting. This arrangement is to continue, subject to the consideration of the Committee, who will probably do nothing until it is seen how far the price of gas can be reduced generally.

In the matter of the reduction of illuminating power, it may be information to some to be told that, though the first step in reducing the high illuminating power which was prevalent in Scotland was taken by the Corporation of Glasgow, they are not now the foremost in respect of that policy, either in practice or in the possession of power to reduce. For many years they were first in both; but I find from the Parliamentary Returns that in Bothwell and Uddingston the Company possess power to send out gas of 15-candle power, and actually supply it of 18·5 candles. While in three other towns in Scotland gas is supplied of 20 candles, as against 21 candles in Glasgow, there are no fewer than 26 places where power is possessed to supply as low as 14 candles, in four places 15 candles, in three places 16 candles, and in two places 18 candles. These figures throw something like a side-light upon the trend of events in Scotland, in the matter of illuminating power.

The Corporation of Aberdeen carried through their annual practice of inspecting the gas-works on Tuesday afternoon; and thereafter refreshments were served in the office. Lord Provost Wallace, who presided, proposed the toast of "Prosperity to the Gas Undertaking." He said they had found everything in first-class order, which reflected great credit alike on the Manager and his staff. Their good friend Mr. Smith was no longer with them. He could assure them that when Mr. Smith resigned his position at the works, many of them thought they would have great difficulty in finding one to fill his place. They had been very fortunate, however, in securing Mr. Samuel Milne as his successor. Mr. Milne, he was glad to say, was carrying out the same policy as was followed by Mr. Smith; and he had no doubt he would do his duty well. They were glad that the Gas Committee had been able to reduce the price of gas by 2d. per 1000 cubic feet; and he hoped that by-and-bye they would be able to give them a further reduction. Mr. Kemp, the Convener of the Gas Committee, in acknowledging the toast, said that in February of last year their attention was drawn to the fact that the gas supply in the central and north-western districts of the city had become inadequate during the hours of greatest demand. To remedy this state of things, their new Engineer recommended that the holder at Gallow Hill should be tapped, and a distributing station erected there. This gasholder was first brought into operation some ten years ago; but until October last it had been used as a reservoir only. Now gas was sent direct into the city from the holder, where a 30-inch governor had been erected. The total expenditure at this station and in laying about 2½ miles of mains had been £5775, or £155 below the estimate. The result had been that the gas supply had been greatly improved, and the usual complaints had been conspicuous by their absence during this winter. The output of gas from Aug. 1 to Jan. 31 was nearly 16½ million cubic feet more than in the corresponding period. In February, 1904, there were 31,210 ordinary meters in use; now there were 31,640—an increase of 430. A year ago there were 5410 prepayment meters fixed; while now there were 6009—an increase of 599. Since the inspection last year a new type of retort-setting had been introduced, and it was being extended; the whole work of which was being done by their own men, and was being paid for out of revenue. The essential feature of the new system was that the producer was for the most part built into the setting. By this arrangement, comparatively little heat was lost by radiation; and the temperature of the under chamber was considerably reduced, besides which the life of the retorts was greatly lengthened.

I have just returned from Peebles, where the Scottish Junior Gas Association (Eastern District) have been paying a visit. There was a good muster of members, headed by Mr. A. Masterton, the President of the District. When the visit was arranged for last summer, it was anticipated that the new gas-works would have been completed by this time. This has been found impossible of accomplishment; and the winter being now past, there is no need to hurry on the construction. It could be seen that the works will be a great convenience, as compared with the existing ones, which are about the worst situated in all Scotland; extension being an impossibility. The new works are upon a site so low that the waters of the Tweed would, in times of very heavy flood, have come in. It has consequently been necessary to raise the level of the various buildings; but for this there was abundance of material, and the excavation from which it was taken will be a handy

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place of deposit for refuse for many years to come. A 12-inch main has been laid from the new works to the town; and at present gas is being sent through it from the old works to light the new ones. There is an incident about gas supply in Peebles which will bear relating. In the days before the transfer, the Corporation resolved to place the foot pavements over the whole of the town in a satisfactory condition, the work to be done once for all. As nearly all the gas-mains were laid in the footpaths, the Gas Company patriotically offered, for the benefit of the town, to lay new mains in the roadways, and to overhaul all their service-pipes. The Corporation assented; and the work of the Company and of the paviors went on side by side. Now the town possesses a complete system of cement pavements, the most handsome I have ever seen; and the gas mains and services are in such a state of perfection that the leakage is trifling. The costs were heavy, to both the ratepayers and the shareholders of the Company; but there has been so much satisfaction in the comfort and convenience felt since, that it is agreed locally that the work was well worth the money expended upon it. The incident furnishes a good illustration of the intelligence and breadth of view which is manifested in the conduct of municipal affairs in Peebles.

It was a "Milne" night at the Royal Scottish Society of Arts on Monday last, all the technical fare before the meeting having been provided by representatives of Messrs. James Milne and Son, Limited. Mr. D. Macfie opened with a communication upon his combined gas meter and governor, prefacing his remarks with a graceful allusion to the labours in the matter of the regulation of gas supply of the late Mr. D. Bruce Peebles, a former President of the Society, whose footsteps, he said, he was humbly following. Mr. Macfie's communication was, as all his productions are, a clear and interesting statement, detailing an invention which must, without doubt, be found to be very useful; but his auditory did not seem to be impressed. Had Mr. Macfie dealt with some of the abstrusities of electricity, he would have had a much more cordial reception. It is not to be accepted that professional gentlemen, having constantly to deal with the events of a work-a-day world, have lost faith in gas; but it is to be feared that the amateur scientists, who are to be found in large numbers in such societies as the Royal Scottish, in the exercise of a conceit which arises out of the proverbial little knowledge, look upon it as a waste of time to consider gas problems. Some of the remarks which were uttered in the discussion upon this and the other papers read that evening were not intelligent, which brought up the reflection that no person talks such sheer nonsense as does the learned man upon a subject he has not studied. The other two papers were both by Mr. H. O'Connor. In one he described his invention for the lighting of incandescent lamps inside lanterns, and showed the working of the apparatus in practice. Without hesitation, it may be said that the invention is the most complete device of the kind which has yet been brought before the public. In his second paper, Mr. O'Connor described an apparatus for determining the proportion of carbonic acid in gases. The subject is one which is of interest to a wider circle than gas managers alone; and probably on that account it received more intelligent attention than did the other two communications.

The ninth ordinary general meeting of the Larkhall Gas Company, Limited, was held on the evening of Friday of last week. The report and balance-sheet for the year showed a sum of £1460 available for appropriation. Out of this, a dividend of 7½ per cent. was paid. The Directors reported that it was necessary to extend the retort-house; and they were authorized to borrow money for the purpose.

CURRENT SALES OF GAS PRODUCTS.

LIVERPOOL, *March* 4.

Sulphate of Ammonia.

The market has again been quiet, and there has been some further decline in values. Available supplies have not been very large, but buyers abroad, having already contracted extensively, have been holding off in regard to further purchases for the chance of easier prices, and sellers have had to submit to concessions in order to induce business. There has been a moderate demand for Home consumption, but it has not been sufficient to sustain the market. The closing quotations are consequently £12 17s. 6d. per ton f.o.b. Hull, £13 per ton f.o.b. Liverpool, and £13 2s. 6d. per ton f.o.b. Leith. Makers seem more inclined to effect sales in the forward position; but their ideas are still out of reach of buyers, and any orders booked have been taken speculatively.

Nitrate of Soda.

This article has also been quiet, and local prices are now 11s. and 11s. 3d. per cwt. for ordinary and refined qualities respectively.

LONDON, *March* 4.

Tar Products.

Markets continue quiet; and there is certainly an absence of business just at present. The value of 90 per cent. benzol cannot now be taken as over 9½d. f.o.b. London. As a rule there is no demand for this quality just at present, although it is reported that there have lately been one or two inquiries from Germany for shipment from the North of England, where the price may still be taken as 9d. per gallon. In 50-90 per cent., one or two small parcels have been placed for home consumption in the Manchester district at prices equal to about 7d. per gallon. There has certainly been an inquiry during the past week for a considerable quantity of this quality for forward delivery; but the price offered by consumers did not tempt manufacturers to sell over any lengthened period. In toluol, there is really nothing fresh to advise, although there have been one or two inquiries for same for delivery in London. Makers here, however, do not

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appear at the moment to be sellers, as the production of the article in this district is very small. There is no actual business doing in solvent, although there is reported to be rather more inquiry for home consumption. In anthracene there is absolutely no business doing, and consumers do not appear to be at all inclined to purchase for early delivery except at very low prices; while makers seem practically indifferent as to selling, and decline to contract forward except at a considerable advance. There has been rather more business doing in carbolic acid; but prices rule decidedly low. Sales are reported at 1s. 9¼d. to 1s. 9½d. for 60's; while some of the German consumers state that they have been able to purchase at even under these prices for March-June, and decline to consider business over the last six months of the year except at a still further reduction in value. There has been considerable inquiry for crystals; but the prices mentioned are very much under those quoted by English manufacturers. Dealers certainly at present appear to be open to take orders at lower figures than those asked by any manufacturer, either in Germany or England. In creosote, there is really very little business doing; and no transactions of importance have taken place during the week. The position remains practically unchanged, although offers of 1⅛d. are reported to have been declined in the Manchester district for a considerable quantity. Prices of pitch are easier, doubtless owing to the strike in Belgium, which continues to have a depressing effect on the market. London makers are reported to be well sold over the first six months of the year. As regards July-December, they do not seem prepared to accept low prices just at present; while consumers will only entertain business at much lower figures than those named by the principal dealers here. Lancashire is still the weakest market, especially for prompt delivery; but no business of any importance has taken place. Yorkshire makers are reported to have accepted low prices for early delivery; but the quantities placed have only been small. It seems as if there would really be very little, if any, business of importance done until matters are more settled on the Continent; and certainly just at present dealers are inclined to sell at proportionately lower prices than will be entertained by any manufacturer, especially in the London district. So far as South Wales is concerned, there has been no business of importance to report. Consumers are still open to purchase over the last six months of the year; but they will only entertain contracts at lower prices than are at present ruling for prompt delivery. Makers, however, do not seem at all anxious to sell past June, owing to the considerable uncertainty which prevails as regards the value of tar.

The average values during the week were: Tar, 18s. to 22s. Pitch, London, 33s. to 33s. 6d.; east coast, 31s. to 31s. 3d.; west coast, 30s. to 31s. Benzol, 90 per cent., 9½d.; 50-90 per cent., 7½d. to 8d. Toluol, 7½d. Crude naphtha, 3d.; solvent naphtha, 8¾d.; heavy naphtha, 9½d. to 10d. Creosote, London, 1⅜d. to 1⅝d.; North, 1¼d. Heavy oils, 2d. to 2⅛d. Carbolic acid, 60 per cent., 1s. 9½d. to 1s. 9⅝d. Refined naphthalene, £4 to £8; salts, 17s. to 20s. Anthracene, "A" quality, 1⅝d. to 1¾d.; "B" quality, unsaleable.

Sulphate of Ammonia.

The market is very quiet indeed; and it is difficult to fix actual values at the various ports. The Gaslight and Coke Company quote £13 7s. 6d.; but this price is purely nominal, as dealers are willing to accept considerably lower figures. In Leith, there is very little actual business reported, makers being unwilling to accept the low prices which are offered. But the market closes with a very quiet tone; and £13 to £13 2s. 6d. may be taken as the nominal value. There is very little business to report in Hull. Early in the week some quantity was placed at £13 2s. 6d. for prompt shipment; but since then the market has been decidedly easier, and it is reported that £13 1s. 3d. and even £13 has been accepted in more than one instance.

COAL TRADE REPORTS.

Lancashire Coal Trade.

There is nothing new to report in the condition of the Lancashire coal trade, except that rumours are being circulated that the miners are beginning to agitate for a return of the 5 per cent. in wages which was taken off their pay last year. The trade in all departments is satisfactory. The German strikers appear to be returning to their work. The result here will be less pressure on the export trade. Prices, however, keep firm, at last Tuesday's quotations. Coal for shipping varies as much in price as for coals on land. Quotations are therefore difficult to supply. Best slack continues scarce. Engine fuel is in good demand, and is likely to continue so for months to come.

Northern Coal Trade.

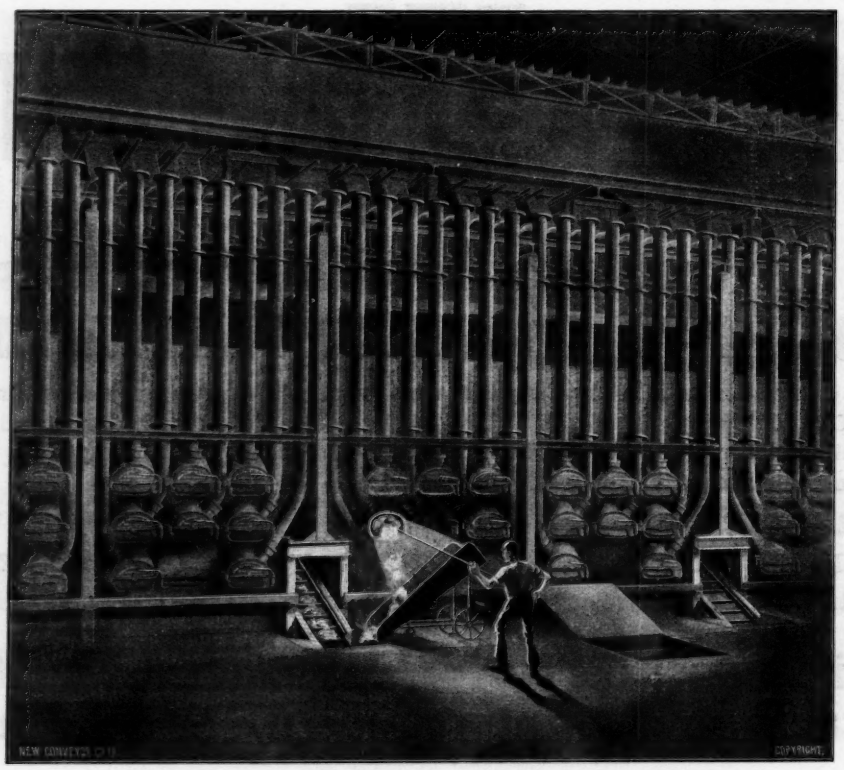
There is a moderate demand for coal at present in the northern trade; and work is not quite full at some of the collieries, partly because of the absence of demand, and partly because the stormy weather has delayed steamers. Best Northumbrian steams are down to 8s. 9d. per ton f.o.b., second-class steams are 8s. per ton, and steam smalls are from 4s. 6d. to 5s. per ton—it being the quiet time for this class of coal. In the gas coal trade, the demand is now beginning to decrease more steadily; but the output of the collieries is still fairly taken up, and the exports will soon increase. For occasional cargoes of Durham gas coals, the price varies from about 7s. 10d. to 8s. 4½d. per ton f.o.b., according to quality. There are some large contracts for gas coals in the market, which are expected to be decided in the course of a fortnight or so; but it is not considered that there will be any great change in prices. Coke is steady; but gas coke is quoted by merchants at lower prices, and perhaps 12s. to 12s. 6d. per ton may be the medium rate f.o.b. in the Tyne for good descriptions.

Scotch Coal Trade.

There is still quietness in the coal market, and, as last week, it is the shipping demand which is responsible. Foreign orders are not

No Drawing Stage.

Perfect Regeneration.



Producer Fed with Hot Coke.

PATENT "DWARF" INCLINED RETORT-BENCH.

NEW CONVEYOR CO., LTD., SMETHWICK.

coming in as freely as they were expected to do ; but it is pointed out that this is always a slack period of the year in the exporting of coal. There is a very fair demand for home purposes. The prices quoted are : Main 7s. 6d. to 7s. 9d. per ton f.o.b. Glasgow, ell 8s. 3d. to 9s. 3d., and splint 8s. 9d. to 9s. The shipments for the week amounted to 218,215 tons—a decrease of 63,862 tons upon the preceding week, but an increase of 34,435 tons upon the corresponding week of last year. For the year to date, the total shipments have been 1,721,284 tons—an increase of 318,998 tons upon the same period of 1904.

TRADE NOTES.

Gibbons Bros.' Regenerative Furnaces.

Several inquiries having been received for copies of the *brochure* entitled a "Description of the Gibbons Generator and Regenerative Settings of Retorts," the publication of which was noticed in the "JOURNAL" for Jan. 31 (p. 285), we are asked to state that this book was not published for sale, but that Messrs. Gibbons Bros. will be pleased to forward a copy to any gas engineer or assistant who may apply to them either at their Dudley office or at Palace Chambers, Westminster.

Laidlaw's Station Meters and Exhausters.

Messrs. R. Laidlaw and Son, Limited, of Edinburgh and Glasgow, have just received an order for another 200,000 cubic feet per hour station meter for the Granton works of the Edinburgh Gas Commissioners. It is to be similar in every respect to the two the firm have already erected there. They have also received an order for two sets of engines and patent exhausters, the same as those already supplied by them for the works named ; each exhauster to be capable of passing 200,000 cubic feet of gas per hour at a speed of 80 revolutions per minute. An order has also been placed with them by the Belfast Corporation Gas Committee for a station meter to pass 200,000 cubic feet of gas per hour ; and another by the Falkirk Gas Commissioners for one to pass 80,000 cubic feet per hour.

Good Work by the Pulsometer.

Testimony has recently been borne by the Borough Engineer of Pontefract (Mr. J. E. Pickard) to the valuable aid rendered by the Pulsometer in an unfortunate occurrence at the Roall Water-Works. It appears that the duplicate set of pumps both broke down within three days, causing what might have been a serious water famine in the district. Thanks, however, to the adaptability of the Pulsometer, and the provision made by the Pulsometer Engineering Company, of Reading, for meeting emergencies of this description, he was enabled, though the pumping station is five miles from a town, to have a complete set of pumps at work in less than 50 hours ; thus averting a catastrophe. A larger Pulsometer set was fixed a day or two later, and this efficiently maintained the water supply for upwards of three weeks, during the time the broken pumps were undergoing repairs. Mr. Pickard says this was not the first occasion on which he had seen conclusively demonstrated the advantages of the Pulsometer pump ; and he considers it has no equal for an emergency.

Le Grand and Sutcliff's Artesian Borings.

Some years ago an artesian well was bored at the Stotfold Brewery, near Baldock, Herts, which for some reason proved a failure. In January last, Messrs. Flitton Bros., decided to have a new boring made, which the Engineers (Messrs. Le Grand and Sutcliff) have just completed. This boring commenced from the bottom of a shaft, 48 feet deep, which passed through the basement of the lower chalk beds, just reaching the gault formation. After boring through the gault, the lower greensand was struck at 250 feet below the surface, and after penetrating only 4 feet into it (a total depth of 254 feet), the water rose up to within 38 feet of the surface. Anticipating this result, the Engineers had previously fixed a sluice-valve on the bore-pipe, so that the inflow could be controlled ; and when the valve was opened, the water rushed in at the rate of more than 3600 gallons per hour.

The Lamp-Standards in the Mall.—"The Times" last Tuesday contained the following letter from a correspondent writing from the Arts Club, Dover Street : "Should not a really fine design for the lamp-standards of the new Processional Road in St. James's Park be sought in public competition ? The private method connected with such designs which have hitherto disgraced the Metropolis should surely not be risked in this important instance. Not only should a worthy design be secured for the occasion, but skilful casting also in the execution, such as may be seen in the Paris thoroughfares, for instance. In London, we have, in this class of work, ignorance of design and brutality of casting of which every artist is ashamed."

The Shortage of Water at Leicester.—At the meeting of the Leicester Corporation last Tuesday, the Water Committee reported that, owing to the continued small rainfall, the stock of water in the reservoirs was reduced to 558,686,000 gallons; showing a deficiency of 820,314,000 gallons. The Committee reported upon certain negotiations with the Loughborough Corporation with a view to obtaining some temporary assistance till the Derwent Valley water is available in 1910 or 1911. The Loughborough Corporation were prepared, when their Blackbrook reservoir is completed and contains a sufficient quantity of water, to supply Leicester with unfiltered water delivered at Nanpantan, at a point to be mutually agreed upon, up to 1¼ million gallons a day, at 2½d. per 1000 gallons. If the value of the water taken by Leicester in any one year shall amount to less than £500, then Leicester is to make up the amount for that year to the sum named. The Committee recommended that the offer be accepted ; and this was agreed to.

TO-DAY

Thousands are cooking

Pancakes

on Richmond's Cookers.

Most Gas Companies

Hire Them.

ADVERTISEMENT OF THE RICHMOND GAS STOVE & METER CO., LTD., LONDON, WARRINGTON, DUBLIN, PLYMOUTH, &c.

Gas v. Electricity for Street Lighting in Belfast.—The Belfast Police Committee have decided to take no further steps at present in the matter of the proposal to substitute arc electric lamps for incandescent gas in a few of the central thoroughfares. A deputation waited upon the Gas Committee, who agreed to make no alteration for another year in their charge for the large gas-lamps now in use; and therefore the Police Committee decided to leave things as they are for twelve months longer.

Improved Street Lighting at the West-End.—A great improvement has been effected by the Westminster City Council in the lighting of St. James's Square and the adjoining thoroughfares, including Jermyn Street, Charles Street, Ryder Street, and King Street. Sackville Street, Shaftesbury Avenue, and all the thoroughfares in the parishes of St. James and St. Anne, Soho, and in the Strand district, in which until this winter flat-flame burners were used, are now well lighted by lamps containing two incandescent burners.

Public Lighting of Cardiff.—The Cardiff Lighting Committee have been lately considering their estimates of the coming year. These showed an increase of nearly £500 for electric light—from £7475 to £7960—but it was pointed out that the cost of gas was estimated at £5600, as against £5930, or a reduction of £330. Further, attention was drawn to the doubling of the light produced by electricity; and these explanations are said to have been considered satisfactory by the Committee. With the other items, the total cost of lighting the town is estimated at £17,440.

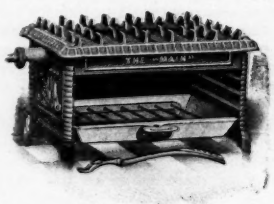
Extensions at the Woking Gas-Works.—Notwithstanding the great competition—possibly the strongest in England for an undertaking of its size—which the Woking District Gas Company have had to face from the introduction of the electric light, they are making rapid progress. The development of the concern has now reached the point which justifies the Directors in making large extensions to meet the increased demand. A new gasholder and steel tank, designed by Mr. Arthur Valon, is about to be erected by Messrs. Samuel Cutler and Sons; and a new retort-house, of somewhat novel construction, also designed by him, will be put up by Messrs. Gibbons Bros. The building will be fitted with regenerator furnaces and settings of the well-known type employed by Messrs. W. A. Valon and Son. Other improvements, comprising new exhausting machinery and a new governor, together with the enlargement and extension of the district mains, are also being carried out. About twelve months since, the Railway Company gave notice to discontinue the supply of gas for lighting their station, taking a supply of electricity in its place. In this way the Company lost by this one customer the sale of 6 million cubic feet of gas per annum; but since that time they have connected with their mains more than 500 new consumers, which has more than recovered the consumption lost.

South Staffordshire Mond Gas Company.—It was stated at the fourth ordinary meeting of the South Staffordshire Mond Gas Company last week that nearly 13 miles of trunk mains have now been laid, through Bilston, Ettingshall, and Wolverhampton on the one side, and Great Bridge, Ocker Hill, Leabrook, Wednesbury, and Walsall on the other. There will also shortly be laid 3 miles of branch mains. Mr. Alfred Mond, who presided, said the distribution question had been most successfully demonstrated. They found they could pass 1½ million cubic feet of air through the pipes per hour with a pressure of 10 lbs.; the outlet being 5½ miles away. This was about 50 per cent. more than the total quantity of gas the present plant could make in the time; and it showed that the mains already laid were capable of delivering at least three times the maximum output of the existing plant. The apparatus was now being tested under working conditions; and they hoped very shortly to begin making and distributing Mond gas. The recently issued report of the Royal Coal Commission stated that if the average steam-engine, with its average consumption of 5 lbs. of coal per horse-power hour, were entirely replaced by gas-producers and gas-engines, the 52 million tons of coal which it was estimated were consumed for power purposes at mines and factories would be reduced to 11 million tons. This would show what an immense waste was going on under the old conditions of working.

A River Water Scheme for Shrewsbury.—A special meeting of the Shrewsbury Town Council was held on Thursday week to receive the following report of the deputation appointed the 8th of August last to interview the Local Government Board with reference to the water supply of the borough: "The deputation first explained the position in which the town was placed by the result of the vote taken upon the Castle Pulverbatch scheme after the Council had recommended it to the ratepayers for adoption, and inquired whether the Board had any means at their disposal by which the Council could be assisted with respect to an upland supply. After considerable discussion, it was made quite clear that it was absolutely impossible for a local authority to carry out any scheme involving the taking of water from streams or from defined channels without an Act of Parliament, and that an Act could not be obtained without the consent of a majority of the ratepayers. Having intimated that, in view of the opposition of the ratepayers, the upland scheme must be abandoned, Mr. Kershaw, one of the Assistant Secretaries of the Board, suggested that the only thing now open to the Council was to proceed to improve the river supply, and that an engineer appointed by the Council for this purpose should confer with the experts of the Board as to safeguarding that source. The deputation have met since their interview with the Board and carefully considered the position, and they now recommend the Council to ask the Water Committee to formulate and report to them upon a scheme for taking an improved supply from the River Severn (retaining the conduit supply, and maintaining it in a state of efficiency), with power to engage such engineering and other assistance as may be deemed requisite. The deputation would point out that it will not be necessary for the Council to obtain an Act of Parliament in order to carry out a scheme for taking an improved supply from the river, as the Council, in conjunction with the Local Government Board, already possess ample powers for this purpose." After a discussion lasting three hours, the report was adopted; an amendment that the ratepayers should again be consulted being defeated by 15 votes to 13.

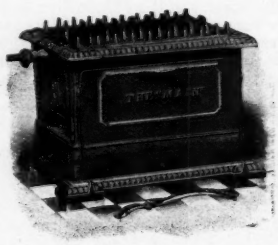
SEASON 1905.

SOME GOOD GRILLERS.



No. 220. PRICE, 6s. 6d.

No. 1251. PRICE, 8s.



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No. 228.
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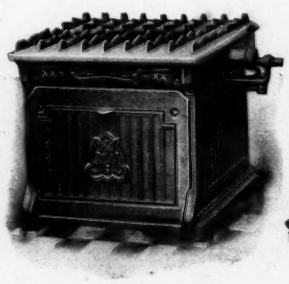
Price - - - - 10s. 6d.



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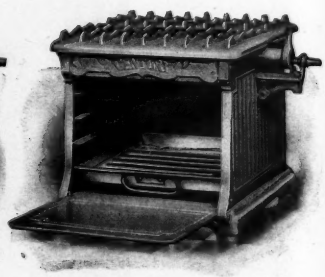

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Price - - - - 14s. 6d.

R. & A. MAIN, LIMITED,

LONDON AND GLASGOW,

ALSO AT

BIRMINGHAM, BRISTOL, MANCHESTER, MELBOURNE, AND SYDNEY.

Rejection of the Torquay Electric Lighting and Power Scheme.—It may be remembered that some weeks ago a Local Government Board Inspector held an inquiry at Torquay into the application of the Town Council for permission to borrow £42,000 for a new electric lighting and power station. Certain facts then disclosed aroused considerable opposition. It was maintained that for electric lighting simply a new station was not required; and that, in view of a doubt of the financial success of trams, it would be wiser to allow the Tramway Company to build their own generating station. A large public meeting on the question was held, and now there has been a postcard poll of the burgesses. The number of voters was 6392, and cards from 6171 were received. The following is the result: Against the scheme, 5069; for it, 416—majority against, 4653.

Ormskirk Public Lighting.—At the monthly meeting of the Ormskirk Urban District Council on the 1st inst., Mr. Ellis moved the confirmation of the minutes of the Electricity Committee, committing them to a scheme costing £20,000 for the electric lighting of the township. Mr. Draper opposed the motion, on the ground that the ratepayers should have an opportunity of expressing their opinion upon such a scheme, which was to include a destructor to cost £2500, though the latter was forced upon them. He was in possession of information from various places showing the advantage of incandescent gas compared with the elecric light for street illumination. It was true that the Council were being guaranteed against loss by the London Electric Construction Company, who had agreed to carry out the works; but there was an element of risk in it. Two other members also opposed the motion; urging that they should take more time to consider the matter. The minutes were, however, confirmed by seven votes to five.

Early Gas Lighting in Bristol.—The following is taken from the "Bristol Times and Mirror:" Broadmead is usually conceded the distinction of having had the first gas-lamp in Bristol. John Breillat, a dyer there, manufactured the light from coal on his own premises, and astounded his neighbours with the brilliant illumination of his shop. He said he could light the streets in the same way; but, of course, the idea was ridiculed. He, however, managed to get permission to make an experiment; and its success led to the building of gas-works on Temple Back—to become three-quarters of a century later the site for the manufacture of the next illuminant, electricity. The Bristol Coal-Gas Company began to light our streets in 1817; and the Company was the second to be formed in England. Breillat was the Company's first Engineer. An Oil-Gas Company established itself in the city in 1823; and thirty years later the two became the Bristol United Gaslight Company—the Company we know to-day under a simpler name.

Reductions in Price.—After the 1st of April, the price of the Castleford and Whitwood Company's gas will be reduced 2d. per 1000 cubic feet; making it 2s. 10d. for lighting and 2s. 6d. for cooking, heating, or power, with 2½ per cent. discount. Owing to the increased consumption of gas and improved methods of manufacture, the Directors of the Maldon Gas Company propose to reduce the price after June 30 to 4s. 2d. per 1000 cubic feet, with a discount of 3d., making 3s. 11d. net, if the account is paid promptly. The Directors of the Harrogate Gas Company have reduced the price of gas to quarterly consumers by 2d. per 1000 cubic feet; and a similar concession to all consumers has been granted by the Tunbridge Wells Company. The Stockport Gas Committee have decided to lower the differential prices chargeable to outside authorities by 2d. per 1000 cubic feet. Next month the Wolverhampton Gas Company will make a further reduction of 6d. per 1000 cubic feet to users of gas-engines, brazing hearths, and enamelling stoves.

Extensions at the Newtownards Gas-Works.—At the last monthly meeting of the Newtownards Urban District Council, the Gas Committee reported that they had had under consideration the advisability of purchasing the property adjoining the gas-works—a matter which had been before them since March last. Having regard to the proximity of this property to the gas-works, and the absolute necessity of ground being required for an early extension, the Committee, having secured from the vendors an offer at the sum of £250, recommended the Council to purchase it on the terms mentioned, with £12 10s. additional expenses for services rendered in connection with the sale. The Committee further recommended the Council to authorize the Gas Manager (Mr. W. H. Roberts) to prepare plans for a new gasholder with steel tank, to measure about 80 ft. by 24 ft., to be erected on the proposed new site, and that he be further instructed to secure from various makers plans of holders with tanks of this size, telescoped and not telescoped. They also recommended that the Town Clerk be instructed to write to a number of consulting gas engineers and learn what their terms would be for scrutinizing and advising the Council on such plans as might be put before them in connection with a new holder. The report was adopted.

In response to the invitation recently contained in our advertisement columns, tenders were submitted on Monday last week for £50,000 of ordinary stock of the Newcastle and Gateshead Gas Company. They ranged from £105 (the minimum) to £112 2s. 6d., and were sufficient for more than twice the quantity of stock offered.

In the Trade Section of the Arts and Crafts Exhibition at Lichfield, the Lichfield Gas Company made a brilliant display of incandescent gas-burners, both ordinary and inverted, together with the newest designs of pendants, brackets, and glass ware. Four old-fashioned burners, illustrating gas lighting in vogue fifty years ago, were also shown by way of comparison. The latest novelties in gas lighting also exhibited at this stand were automatic gas-lighters for single or groups of burners. In conjunction with the Company, Messrs. Parkinson and Cowan, Limited, exhibited at work a glass-cased penny-in-the-slot meter similar to those in general use, a very fine combined mantelpiece, tiled hearth, kerb, and gas-fire, and other useful articles. Mention should also be made of the brilliant lighting of the hall by means of Keith and Blackman's high-pressure incandescent gas-lamps, both inside and at the entrance; the installation being supplied and fixed free by the Gas Company. The efficiency of the lighting arrangements added greatly to the attractiveness of the exhibition.

PARKINSON'S

SLOT INSTALLATIONS

FOR QUOTATIONS

WRITE—

PARKINSON AND W. & B. COWAN, LTD.
(*Parkinson Branch*),

COTTAGE LANE, CITY ROAD, LONDON.

BELL BARN ROAD, BIRMINGHAM.

The Directors of the San Paulo Gas Company recommend a final dividend of 4 per cent., free of tax, making 7 per cent. for the past year, placing £3000 to the reserve, and carrying forward £3466.

The report of the Directors of the Richmond Gas Stove and Meter Company, Limited, for the year ending the 31st of December, to be presented at the general meeting on Thursday, sets forth that the balance standing to the credit of the profit and loss account, after deducting debenture interest and the Managing Directors' commissions, and including the amount brought forward from last year, is £31,080. The payment of the 6 per cent. dividend on the preference shares will absorb £5743; one at the rate of 10 per cent. (free of income-tax) on the ordinary shares, £8035; and a bonus (also free of income-tax) at the rate of 2½ per cent., £2009. A sum of £4336 is to be written off for depreciation, and £5000 is to be placed to the credit of the general reserve fund, bringing this fund and the branch reserve fund up to £28,158. This will leave an amount of £5958 to be carried forward, subject to a vote for Directors' remuneration.

Mr. H. T. Hickman, of Stourbridge, has secured a contract with the Salford Corporation for retorts, fire-bricks, blocks, and fire-clay.

Moore's Air Gas Syndicate, Limited, has been registered with a capital of £2000 in 5s. shares, to carry on the business indicated by the title. There will be no initial public issue.

At the general meeting of John Wright and Eagle Range, Limited, to be held in Birmingham to-morrow, the Directors will report that the profit for the past year, after providing for the contingent reserve and charging Directors' fees, Managing-Directors' remuneration, and depreciation on the buildings and plant, amounts £53,734. After adding the balance (£7489) brought forward, and deducting the interim dividends (£17,952) paid in August, there remains the sum of £43,271, which the Directors recommend shall be appropriated as follows: Dividend at the rate of 6 per cent. per annum for the half year on the preference shares, less income tax, £2422; dividend of 2s. 6d. per share on the ordinary shares, free of income-tax, £25,875; to the reserve fund, £5000; and to carry forward, £9974.

WANTED, FOR SALE, CONTRACT, &c., ADVERTISEMENTS IN THIS WEEK'S "JOURNAL."

Situations Vacant.

MANAGER. Banbury Gas Company. Applications by March 20.
LADY SHOW-ROOM ATTENDANT. No. 4355.
WORKING FOREMAN. No. 4353.

Situations Wanted.

FITTER AND GENERAL WORK. No. 4350.
OUTDOOR SUPERINTENDENT. No 4348.
WORKING MANAGER. Fitter, Saltley.

Plant, &c., Wanted.

STATION METER. No. 4354.

Plant, &c., for Sale.

CARBURETTED WATER GAS PLANT COMPLETE. STATION METER, GASHOLDER, SCRUBBER, AND 2750 GALLONS OF ENRICHING OIL. Hoylake and West Kirby Gas Company. Tenders by March 31.
DRAWINGS AND PATTERNS FOR EVERY DESCRIPTION OF GAS PLANT AND APPARATUS. By Auction, March 10.
PULSOMETER PUMP. Peebles Gas-Works.
WALKER'S PURIFYING MACHINE AND PURIFIERS. Ravensthorpe Gas Company.

Tar-Works for Sale.

REGINALD BARROW, Clayton.

Loans.

DERWENT VALLEY WATER BOARD.

Company Meeting.

OTTOMAN GAS COMPANY. Offices, March 14. One o'clock.

Stocks and Shares.

KINGSTON-ON-THAMES GAS COMPANY. March 16.
WATER AND GAS DEBENTURES. Langborne, Malton.
WORTHING GAS COMPANY. No. 4351.

TENDERS FOR

Coal and Cannel.

HEYWOOD GAS DEPARTMENT. Tenders by March 14.
STOCKPORT GAS DEPARTMENT. Tenders by March 15.

Cookers.

PONTYPRIDD GAS DEPARTMENT. Tenders by March 13.

Fire-Clay Goods.

RAMSGATE GAS DEPARTMENT. Tenders by March 11.
STOCKPORT GAS DEPARTMENT. Tenders by March 15.

Gas Engine and Exhauster.

BRITON FERRY GAS DEPARTMENT. Tenders by March 20.

General Stores, Ironmongery, Oils, Paints, Chemicals, Shovels, &c., &c.

STOCKPORT GAS DEPARTMENT. Tenders by March 15.

Lime.

STOCKPORT GAS DEPARTMENT. Tenders by March 15.

Meters and Meter Fittings.

STOCKPORT GAS DEPARTMENT. Tenders by March 15.

Purifier Grids.

STOCKPORT GAS DEPARTMENT. Tenders by March 15.

Sulphuric Acid.

PONTYPRIDD GAS DEPARTMENT. Tenders by March 13.
RAMSGATE GAS DEPARTMENT. Tenders by March 11.

Tar and Liquor.

COLNE GAS DEPARTMENT. Tenders by March 20.
EXETER GAS COMPANY. Tenders by March 11.
MACCLESFIELD GAS DEPARTMENT. Tenders by March 13.
PONTYPRIDD GAS DEPARTMENT. Tenders by March 13.
RAMSGATE GAS DEPARTMENT. Tenders by March 11.

Tubing, &c.

STOCKPORT GAS DEPARTMENT. Tenders by March 15.

Washer and Washer Scrubber.

MANCHESTER GAS DEPARTMENT. Tenders by March 30.

NOTICES TO CORRESPONDENTS, ADVERTISERS, AND SUBSCRIBERS.

No notice can be taken of anonymous communications. Whatever is intended for insertion in the "JOURNAL" must be authenticated by the name and address of the writer; not necessarily for publication, but as a proof of good faith.

COPY FOR ADVERTISEMENTS for the "JOURNAL" should be received at the Office NOT LATER than TWELVE O'CLOCK NOON ON MONDAY, to ensure insertion in the following day's issue.

Orders for Alterations in, or stoppages of, PERMANENT ADVERTISEMENTS should be received by the FIRST POST on SATURDAY.

Wanted, For Sale, and Tender Advertisements, Six Lines and under, 3s.; each additional Line, 6d.

TERMS OF SUBSCRIPTION to the "JOURNAL."

United Kingdom: One Year, 21s.; Half Year, 10s. 6d.; Quarter, 6s. 6d.
Payable in Advance. If credit is taken, the charge is 25s. a year.

Abroad (in the Postal Union): £1 7s. 6d., payable in Advance.

All Communications, Remittances, &c., to be addressed to WALTER KING, 11, BOLT COURT, FLEET STREET, LONDON, E.C.
Telegrams: "GASKING, LONDON." Telephone: P.O. 1571a Central.

OXIDE OF IRON.

O'NEILL'S OXIDE has a larger annual sale than all other Oxides combined.

SPENT OXIDE purchased in any district.

GAS PURIFICATION & CHEMICAL CO., LD.
JOHN WM. O'NEILL, Managing Director,
PALMERSTON HOUSE, LONDON, E.C.

WINKELMANN'S
"VOLCANIC" FIRE CEMENT.
Resists 4500° Fahr. Best for GAS-WORKS.
ANDREW STEPHENSON, 182, Palmerston House, Old Broad Street, London, E.C. "Volcanism, London."

SULPHURIC ACID for Sale, specially suitable for making Sulphate of Ammonia.
BROTHERTON AND CO, LTD., Chemical Manufacturers. Works: BIRMINGHAM, LEEDS, and WAKEFIELD.

JOHN RILEY & SONS, Chemical Manufacturers, Hapton, near Accrington, are MAKERS of Special SULPHURIC ACID, for Sulphate of Ammonia Making. Highest percentage of Sulphate of Ammonia obtained from the use of this Vitriol, which has now been used for upwards of 50 Years. References given to Gas Companies.

GAS TAR wanted.
BROTHERTON AND CO., LTD., Tar Distillers. Works: BIRMINGHAM, GLASGOW, LEEDS, LIVERPOOL, AND WAKEFIELD.

J. & J. BRADDOCK (Branch of Meters Limited), Globe Meter Works, OLDHAM, and 45 & 47, Westminster Bridge Road, LONDON, S.E.
WET AND DRY GAS-METERS, PREPAYMENT METERS, STATION METERS, AND GOVERNORS.
REPAIRS RECEIVE PROMPT ATTENTION.
Telephones: 254 Oldham, and 2412 HOP, London.
Telegrams:—
"BRADDOCK, OLDHAM," and "METRIQUE, LONDON."

DUTCH OXIDE OF IRON.

THE First Dutch Bog Ore Co., Ltd.,
(Eerste Hollandsche Yzererts Maaty), ROTTERDAM.
General Manager (for England and Wales)—
CHARLES E. FRY, LEAMINGTON; and at Tower Chambers, Brown Street, MANCHESTER.
London Managers—
E. PADFIELD & CO., 96-98, Leadenhall Street, LONDON, E.C.
General Manager (for Scotland)—
J. B. MACDERMOTT, 11, Bothwell St., GLASGOW.

BROTHERTON & CO., LIMITED.
Offices: Commercial Buildings, LEEDS.
Correspondence invited.

"VITERNUS" METALLIC PAINT FOR GAS-WORKS PLANT.
JOHN E. WILLIAMS AND CO.,
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OXIDE OF IRON.
(NATURAL.)
BALE & CHURCH will be pleased to send Quotations and Samples on application.
SPENT OXIDE PURCHASED.
BALE'S FIRE CEMENT for all Retort and Furnace work.
PAINT for Gasholders, Purifiers, &c.
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SULPHURIC ACID.
SPECIALLY prepared for the Manufacture of SULPHATE OF AMMONIA.
SPENCER, CHAPMAN, AND MESSEL, LIMITED, 36, Mark Lane, LONDON, E.C. Works: SILVERTOWN.
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Telephone: 341, AVENUE.

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WESTBURY OXIDE is now being extensively used for Gas Purification.
For Price and Analysis write to the NEW WESTBURY IRON COMPANY, LIMITED, WESTBURY, WILTS.

PATENTS AND TRADE MARKS PUBLICATIONS, "MERCHANDISE MARKS ACT, and Decisions thereunder," 1s.; "TRADE SECRETS v. PATENTS," 6d.; "DOCTRINE of EQUIVALENTS, Mechanical and Chemical," 6d.; SUBJECT-MATTER of PATENTS," 6d.
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ROBERT DEMPSTER & SONS, Ltd., Contractor for Complete CARBONIZING PLANTS and every description of GAS APPARATUS and ELEVATING and CONVEYING PLANT, ROSE MOUNT IRON-WORKS, ELLAND.

ATTERTON'S Patent Charging Machine, especially adapted for Small Works up to 50 Millions. Nearly 40 already supplied, and still supplying. Would soon repay for small outlay. Increased make and reduction in cost.
Apply to E. PADFIELD AND CO., 96 & 98, Leadenhall Street, LONDON, E.C.

COAL GAS TAR wanted.
BEST PRICES GIVEN.
SHARPNESS CHEMICAL COMPANY, LIMITED, Sharpness Docks, GLOS.

AMMONIACAL Liquor wanted.
BROTHERTON AND CO., LTD., Ammonia Distillers. Works: BIRMINGHAM, GLASGOW, LEEDS, LIVERPOOL, AND WAKEFIELD.

SULPHATE OF AMMONIA SATURATORS and all LEAD and TIMBER WORK in Connection with Sulphate Plants.
We guarantee promptness, with efficiency for Repairs.
JOSEPH TAYLOR AND CO., CENTRAL PLUMBING WORKS, BOLTON.
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HYDRATED OXIDE OF IRON.
PREPARED from Pure Iron.
Twice as Rich as Bog Ore.
Gives no Back Pressure.
The Cheapest in the Market.
Can be Exchanged for Spent Oxide.
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GASHOLDER PAINTING.
PAINTING Work for all kinds of Gas- Works Plant undertaken by contract or otherwise.
FREDERICK BOYALL, 31, Regent's Row, Queen's Road, DALSTON, N.E. Established 1850.

SPENT OXIDE.
THE South Metropolitan Gas Company are always open to receive OFFERS of SPENT OXIDE.
Chief Office: 709, Old Kent Road, London, S.E.
Telegrams: "METROGAS, LONDON."

BIGGS, WALL, & CO., 13, Cross Street, Finsbury, E.C. *Telegrams:* "RAGOUT," LONDON. *Telephone:* 273 CENTRAL.
SATURATORS—See Advt. in last week's issue.
SULPHATE PLANT—See Advt. in this week's issue.
CHARGING MACHINES—See Advt. in next week's issue.

GLASS SHADES of every description, for all kinds of Interior **GAS LIGHTING.** Illustrated sheets on application.
JOHN WALSH WALSH,
SOHO AND VESTA GLASS WORKS, BIRMINGHAM.
Telegrams: "VESTA, BIRMINGHAM."
National Telephone: No. 63.
London Show-Room: 4, HOLBORN CIRCUS, E.C.

GAS TAR and AMMONIACAL LIQUOR wanted by
GEORGE MILLER AND CO., Tar Distillers, 40, West Nile Street, GLASGOW.

BOOK-KEEPER.
APPLICANTS replying to No. 4345 in the "JOURNAL" for the 21st of February, are THANKED for their Communications and informed that the Vacancy has now been FILLED.

WANTED, a situation by a Young, Active Man, as ERECTOR, FITTER, or any General Work inside or out. A thorough all-round knowledge.
Address No. 4350, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED, a situation as Working MANAGER. Fifteen Years Practical Experience. Good Carbonizer, Main and Service Layer. Used to Engines and Exhausters, Meter Indexing, and the General Routine of Gas-Works. Good Testimonials.
Address FITTER, 41, Arley Road, Saltley, BIRMINGHAM.

OUTDOOR SUPERINTENDENT.
AN Energetic, Tactful Man, Age 35, who has for the last Ten Years successfully Managed a small Gas Undertaking, will shortly be free and prepared to take over a post as above. Well up in Main and Service Laying, General Gas-Fitting, able to advise on all matters connected with uses of Gas, prepare Estimates, and able to take Sole Charge of the Distribution Department. Moderate Salary.
Address No. 4348, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED, a thoroughly Practical Man as WORKING FOREMAN for Works making about 50 Millions. Must be a good Carbonizer and experienced in all Gas-Works Plant and Machinery.
Apply, by letter, stating Wages required, and giving detailed account, with dates of Training and Experience, to No. 4353, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

LADY ATTENDANT FOR SHOW-ROOM.
A GAS Company, situated about 30 Miles from London, invite APPLICATIONS for the above post. The Candidate appointed will be expected to attend to Sale of Stoves, Fittings, Burners, &c., and to keep careful account of same. Salary to commence £40 per annum.
For further Particulars, apply to No. 4355, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

BANBURY GAS COMPANY.
WANTED by the above Company, making 60 Million cubic feet of Gas per Annum, a Young and Energetic MANAGER qualified to take the Entire Charge of the Works, and also act as Assistant-Secretary, and to work with the Managing-Director, Mr. W. R. Cooper. There will be provided on the Works a First-Class Residence, Gas, and Fuel.
Apply, stating Age and Salary required, and also enclosing *copies* of Two Testimonials, to JOSEPH SAUL, Esq., Chairman of the Company, Mayfield, Banbury, OXON., on or before Monday, the 20th of March, 1905.

WANTED to purchase, a Second-hand STATION METER, either 40,000, 50,000 or 60,000 cubic feet per hour.
Send full Particulars to No. 4354, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

OLD Established Tar-Works For Sale. Plenty of room to extend on valuable Plot of freehold land. Situated on Canal.
Apply, REGINALD BARROW, Clayton, MANCHESTER.

£1000 Water and Gas Deben- tures FOR SALE, with Two Months accrued Interest. First-Class investment. Paying punctually 4½ per cent. Money required by Trustees for Division among Beneficiaries abroad.
Apply, FRANK LANGBORNE, Solicitor, Malton, YORKS.

SHARES FOR SALE.
50 FULLY-paid £10 Ordinary Shares, in the WORTHING GAS COMPANY. The full dividend of 7 per cent. has been paid for many Years past. Offers invited, for all or part, before the 11th inst.
Address No. 4351, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

NEW Gasholder, 40 ft. diameter by 12 ft. deep, with Steel Standards; also new STEEL TANK to contain same.
Write J. WRIGHT, 181, Queen Victoria Street, LONDON, E.C.

TESTING PLANT FOR SALE—We have several small Sets of GAS APPARATUS, including Retorts, Condensers, Scrubber, Purifiers, Gasholders, overhauled and guaranteed, or New throughout.
FIRTH BLAKELEY AND CO., Thornhill, DEWSBURY.

FOR SALE.
PULSOMETER Pump, size No. 7, with sliding suction-pipe. Good as new. Boiler, second-hand, vertical 10 ft. by 4 ft. 6 in., Two Cross Tubes, and Mountings complete, in good Order.
Apply, MANAGER, Gas-Works, PEEBLES, N.B.

PURIFIERS, &c., FOR SALE—Sets of 4 ft., 5 ft., 6 ft., 8 ft., 9 ft., 10 ft., 12 ft., 18 ft. squares; also 16 ft. by 12 ft., &c. SCRUBBERS, 8 ft. by 60 ft. 10 inch, 18 inch Square METERS. EXHAUSTERS up to 50,000 feet per hour in Stock. GASHOLDERS and TANKS, also New. State requirements.
FIRTH BLAKELEY AND CO., Thornhill, DEWSBURY.

GAS PLANT for Sale—I can always offer NEW and SECOND-HAND GAS APPARATUS, including Retorts and Fittings, Condensers, Exhausters. Scrubbers, Washers, Purifiers, Gasholders, Tanks, Valves, Connections, &c. Also a few COMPLETE WORKS. Compare Prices and Particulars before ordering elsewhere.
J. F. BLAKELEY, Gas Engineer, Thornhill, DEWSBURY.

HOYLAKE AND WEST KIRBY GAS AND WATER COMPANY, LIMITED.

THE Directors of the above-named Company invite TENDERS for the immediate purchase and removal from the Hoylake Gas-Works of the following PLANT:—

1.—One complete CARBURETTED WATER-GAS PLANT, by Humphreys and Glasgow, capable of producing 125,000 cubic feet per diem, consisting of Generator, Carburettor, Superheater, and Washer and Test Purifier, Coke Hoist, Iron Operating Floor and Staircase, Vertical Engine, Blower Fan, Belt and Shafting, Tar-Separator, Oil Storage Tank, and Oil-Pump.
2.—About 2750 Gallons of ENRICHING OIL supplied by the Anglo-American Oil Company.
3.—One GASHOLDER (diameter 44 feet) capacity 19,000 cubic feet, Standards, and Girders.
4.—One 8-inch STATION METER and HAND-LOADING GOVERNOR.
5.—One 8-inch SCRUBBER, by Piggott & Co., 20 feet high by 5 feet diameter.

Proposed extensive alterations will necessitate the removal of the above Plant, which is on Sale as it now stands; and the purchasers will have to undertake dismantling and removal within One Month of being notified that their Tender is accepted.
The Directors do not bind themselves to accept the highest or any Tender.
Sealed Tenders, marked "Offer for Plant," to be lodged with the undersigned not later than Friday, the 31st inst.

ARTHUR GEO. READDY, Secretary.
Quadrant, Hoylake,
March 3, 1905.

MIRFIELD GAS COMPANY.

FOR SALE — Walker's Purifying MACHINE with Tar-Extractor at base, 12-inch Connections. Capacity 500,000 Cubic feet per day. Four Twin-Lute PURIFIERS, 20 ft. by 10 ft. by 5 ft. deep, 12-inch Connections, and Overhead Lifting Gear.
Further Particulars on application to the undersigned.

J. W. TURNER, Manager.
Gas Company's Office, Ravensthorpe,
Near Dewsbury, March 1, 1905.

BOROUGH OF MACCLESFIELD.

TENDERS FOR TAR AND AMMONIACAL LIQUOR.

THE Gas Committee are prepared to receive TENDERS for the purchase of the surplus TAR and AMMONIACAL LIQUOR made at their Works during the Twelve Months commencing the 1st day of April, 1905.
Tenders for the Tar or Liquor separately to be sent in not later than Monday, March 13, 1905, addressed to the Chairman of the Gas Committee, Town Hall, Macclesfield, and endorsed "Tender for Tar, &c."
For Conditions, apply to Mr. W. Newbigging, Engineer, Gas-Works, Macclesfield.
The Committee reserve to themselves the right of accepting any Tender for the Tar or the Liquor separately.
The highest or any Tender not necessarily accepted.

ARTHUR T. PATTINSON, Town Clerk.
Feb. 15, 1905.

RAMSGATE CORPORATION.
(GAS DEPARTMENT.)

TENDERS FOR FIRE-CLAY GOODS.

THE Gas and Water Committee invite TENDERS for the supply of about 400 Feet of Stourbridge or other approved quality FIRE-CLAY RETORTS, about 15,000 FIRE BRICKS, TILES, &c., and about 20 Tons of FIRE-CLAY.
Tenders to be sent in on or before Saturday, the 11th day of March, 1905, addressed to the Chairman of the Gas and Water Committee, Boundary Road, Ramsgate, and endorsed "Tender for Fire-Clay Goods."
The Committee do not bind themselves to accept the lowest or any Tender.
Specification and full Particulars on application to

T. N. RITSON, Engineer and Manager.
Gas and Water Offices,
Boundary Road, Ramsgate.

RAMSGATE CORPORATION.
(GAS DEPARTMENT.)

TENDERS FOR SULPHURIC ACID.

THE Gas and Water Committee invite TENDERS for the supply of about 225 Tons of best BRIMSTONE ACID (what is known as 80 per cent. acid with a specific gravity of 142° Twaddel), to be delivered in equal monthly quantities between the 1st of April, 1905, and the 31st of March, 1906.
Tenders to be sent in on or before Saturday, the 11th day of March, 1905, addressed to the Chairman of the Gas and Water Committee, Gas-Works, Boundary Road, Ramsgate, and endorsed "Tender for Sulphuric Acid."
The Committee do not bind themselves to accept the lowest or any Tender.
Further Particulars on application to

T. N. RITSON, Engineer and Manager.
Gas and Water Offices,
Boundary Road, Ramsgate.

RAMSGATE CORPORATION.
(GAS DEPARTMENT.)

TENDERS FOR TAR.

THE Gas and Water Committee invite TENDERS for the purchase of the Surplus TAR (150,000 Gallons or thereabouts) to be made between the 1st of April, 1905, and 31st of March, 1906.
Tenders to be sent in on or before Saturday, the 11th day of March, 1905, addressed to the Chairman of the Gas and Water Committee, Gas-Works, Boundary Road, Ramsgate, and endorsed "Tender for Tar."
The Committee do not bind themselves to accept the highest or any Tender.
Further Particulars on application to

T. N. RITSON, Engineer and Manager.
Gas and Water Offices,
Boundary Road, Ramsgate.

MANCHESTER CORPORATION GAS-WORKS.

TO GAS ENGINEERS AND CONTRACTORS.

THE Gas Committee of the Corporation of Manchester are prepared to receive TENDERS for the supply, delivery, and erection of a LIVESEY WASHER and a ROTARY WASHER-SCRUBBER at their Gaythorn Station.
Specifications may be obtained on application to Mr. C. Nickson, Superintendent, Gas Department, Town Hall.
Any other Information required may be obtained on application to Mr. J. G. Newbigging, M.Inst.C.E., Engineer, at his Office, Rochdale Road Station.
Sealed Tenders, addressed to the Chairman of the Gas Committee, and endorsed "Tender for Livesey Washer," and "Rotary Washer-Scrubber" respectively, must be delivered at the Gas Office, Town Hall, Manchester, not later than Twelve noon on Thursday, the 30th of March, 1905.
The Committee do not bind themselves to accept the lowest or any Tender.

By order.
WM. HENRY TALBOT, Town Clerk.
Town Hall, Manchester,
March 3, 1905.

BRITON FERRY URBAN DISTRICT COUNCIL.

THE above Council are prepared to receive TENDERS for the supply and erection of a GAS ENGINE and EXHAUSTER at their Gas-Works, Briton Ferry, and other Work incidental thereto, according to Drawings and Specification prepared by Mr. John Mogford, Manager, Gas-Works, Briton Ferry, at whose Office the same may be obtained on application.

Sealed Tenders, endorsed "Gas-Works Extensions," to be sent to the undersigned not later than Tuesday, March 21, 1905.

The Council do not bind themselves to accept the lowest or any Tender.

By order,
FRED. H. KEMPTHORNE,
Clerk.

Council Offices, Briton Ferry,
Feb. 28, 1905.

BOROUGH OF COLNE.
(GAS DEPARTMENT.)

THE Gas Committee invite Tenders for the surplus TAR made at their Works during the Twelve Months ending March 31, 1906.

Particulars may be obtained on application to the undersigned.

Sealed Tenders, endorsed "Tar," must be addressed to the Chairman of the Gas Committee, Gas-Works, Knotts Lane, Colne, Lancs., and delivered not later than Monday morning, March 20, 1905.

The highest or any Tender not necessarily accepted.

FRED THORPE,
Engineer and Manager.

Gas-Works, Knotts Lane,
Colne (Lancs.), Feb. 20, 1905.

PONTYPRIDD URBAN DISTRICT COUNCIL.
(GAS DEPARTMENT.)

THE above Council are prepared to receive TENDERS for the supply and delivery of
1.—SLOT COOKERS.
2.—HIRING COOKERS.

Forms of Tender and Specification may be obtained from the Engineer and Manager, Mr. Edward Jones, Gas-Works, Treforest, Pontypridd.

The Council do not bind themselves to accept the lowest or any Tender.

Sealed Tenders, endorsed "Cookers Contract No. 1," must be received by me not later than March 13, 1905.

J. COLENSO JONES,
Clerk to the Council.

Council Chambers,
Pontypridd, March 1, 1905.

PONTYPRIDD URBAN DISTRICT COUNCIL.
(GAS DEPARTMENT.)

THE above Council are prepared to receive TENDERS for:
1.—The supply of 100 Tons of SULPHURIC ACID for Sulphate Manufacture, in quantities as required.
2.—The purchase of the Council's surplus TAR (approximate quantity 600 Tons).

Forms of Application and Specification may be obtained from the Engineer and Manager, Mr. Edward Jones, Gas-Works, Treforest, Pontypridd.

The Council do not bind themselves to accept any Tender.

Sealed Tenders, endorsed "Acid Contract No. 3," or "Tar," (as the case may be), must be received by me not later than March 13, 1905.

J. COLENSO JONES,
Clerk to the Council.

Council Chambers,
Pontypridd, March 1, 1905.

COUNTY BOROUGH OF STOCKPORT.
(GAS AND ELECTRICITY DEPARTMENT.)

TENDERS FOR STORES, CANNEL, AND COAL.

THE Gas and Electricity Committee are prepared to receive TENDERS for the supply of the following MATERIAL and CANNEL and COAL.

GENERAL STORES for One Year from April 1, 1905, to March 31, 1906.

CANNEL and COAL for One, Two, or Three Years.

1.—Bolts and Nuts.
2.—Brushes.
3.—Brass and Meter Fittings.
5.—Castings.
6.—Drysaltery.
7.—Retort and Fire Goods.
8.—Glass, Red and White Lead.
9.—Iron and Steel.
10.—Ironmongery.
11.—Lead Pipe.
12.—Mill Furnishing.
13.—Oils and Tallow.
14.—Purifier Grids.
15.—Ropes and Flax.
16.—Shovels and Pick Heads.
17.—Timber, English and Foreign.
18.—Tubing.
19.—Wet and Dry Meters.
20.—Stationery.
21.—Lime.
22.—Cannel and Coal for One, Two, or Three Years.
23.—Oil.
24.—Engine Coal for Electricity Works.

Forms of Tender and all further Information may be obtained on application to the Engineer, Gas-Works, Portwood, and for Tender 24 from the Engineer, Electricity Station, Millgate.

No Form of Tender other than that issued by the Committee will be accepted.

Sealed Tenders, endorsed "1, 2, 3," &c., as the case may be, must be addressed to the Chairman of the Gas and Electricity Committee, and be delivered at the Town Clerk's Office on or before the 15th of March next, ensuing.

No Tender will be accepted without satisfactory proof that the firm tendering pays the Trade Union rate of Wages, and observes the Trade Union number of hours, as are usually paid and observed in the district where the goods are made or produced.

The Committee do not bind themselves to accept the lowest or any Tender.

By order,
ROBERT HYDE,
Town Clerk.

Stockport, March 4, 1905.

BOROUGH OF HEYWOOD.

THE Gas Committee invite Tenders for the supply of 9000 Tons of COAL.

Specification and Form of Tender may be obtained upon application to Mr. W. Whatmough, Gas Manager.

Sealed Tenders, endorsed "Coal," to be sent to me not later than Tuesday, March 14, 1905.

By order,
GEO. G. BOUCHIER,
Town Clerk.

Municipal Buildings, Heywood.
Feb. 16, 1905.

TENDERS FOR TAR.

THE Directors of the Exeter Gaslight and Coke Company invite TENDERS for their surplus TAR for Twelve Months from the 25th of March next, at per ton of 200 Gallons, delivered into Contractor's Tanks at the Company's Works.

Sealed Tenders, endorsed "Tender for Tar," will be received by the undersigned on or before Saturday, the 11th of March next; but the Directors do not bind themselves to accept the highest or any Tender.

By order,
W. A. PADFIELD,
Engineer and Secretary.

Gaslight Offices, Exeter.
Feb. 22, 1905.

OTTOMAN GAS COMPANY, LIMITED.

NOTICE is Hereby Given, that the ORDINARY GENERAL MEETING of the Shareholders of this Company will be held at the Offices of the Company, 9, Queen Street Place, Cannon Street, E.C., on Tuesday, the 14th day of March, 1905, at One o'clock in the Afternoon precisely, to receive the Report of the Directors and Statement of Accounts for the Half Year ended the 31st of December last, to declare a Dividend for the same period, to elect Directors and Auditors in place of those retiring, and to transact the General Business of the Company.

The TRANSFER BOOKS WILL BE CLOSED from the 6th day of March until after the Meeting.

By order of the Board,
THOMAS GUYATT, Secretary.

9, Queen Street Place, Cannon Street,
London, E.C., Feb. 28, 1905.

ISSUES BY AUCTION OF GAS AND WATER STOCKS AND SHARES.

MR. ALFRED RICHARDS begs to notify that his ISSUES by AUCTION under PARLIAMENTARY POWERS of STOCKS and SHARES in LONDON, SUBURBAN, and PROVINCIAL GAS and WATER COMPANIES take place PERIODICALLY at the Mart, TOKENHOUSE YARD, E.C.

Terms for Issuing such Capital, and also for including Gas and Water Stocks and Shares belonging to Private Owners in these Periodical Sales, can be obtained on application at Mr. ALFRED RICHARDS' OFFICES, 18, FINSBURY CIRCUS, E.C.

By order of the Directors of the
KINGSTON-UPON-THAMES GAS COMPANY.

NEW ISSUE OF £10,000 CONSOLIDATED ORDINARY STOCK.

MESSRS. NIGHTINGALE, PHILLIPS, AND PAGE will SELL THE ABOVE BY AUCTION, in Lots, at the Kingston Hotel, opposite the Station, Kingston-on-Thames, on

THURSDAY, MARCH 16, 1905, AT FIVE O'CLOCK.

Particulars of the AUCTIONEERS, KINGSTON-ON-THAMES, or of MR. S. C. SHERRARD, Secretary, Gas Offices, KINGSTON-ON-THAMES.

THE Derwent Valley Water Board is prepared to receive a LIMITED AMOUNT OF MONEY, upon Mortgage, at £3½ per cent. per annum, either for a Term of Years, not exceeding seven, or Repayable at Six Months' notice from either party.

The Moneys required for carrying out the Works of the Board are secured upon the Revenues and Rates of Derby, Leicester, Nottingham, and Sheffield in due proportion.

Applications to be sent to Mr. W. Gill Hodgson, Accountant to the Board, Bamford. *viâ* Sheffield.

By order,
O. B. STEWARD,
Clerk to the Board.

ST. NEOTS, HUNTS,
On the G.N. Rly. Main Line, 50 miles from London.

MESSRS. MADDISON & SON, have been favoured with Instructions to SELL BY AUCTION, on Friday, March 10, 1905, at the Meter-Works, Brook Street, and the Vulcan Iron-Works, Market Square.

An extensive and valuable collection of Patterns in Wood and Metal, used in the erection of Gas-Works in any part of the World, with some hundreds of Zincos and Electros, Tracings, Prints, detailed and finished Drawings for the Complete Equipment of Gas and Meter Works for cities, towns, villages, factories, and private residences, comprising Retorts of all kinds, Air and Water Condensers, Scrubbers and Washers, Engines and Exhausters, Hand and Power Pumps, Purifiers, Gas and other Valves, Station Meters, Governors, Gasholders and Tanks, Consumers Wet and Dry Gas-Meters and Prepayment Meters, Lamp Columns and Brackets, Shadowless and Interchangeable Street-Lanterns, Air-Pumps, Gas-Heating and Cooking Stoves, Carburettors, Gas and Water Mains, Hot Water and Steam Heating Apparatus, a large quantity of new rising Plug and Through-Way Valves, Centre Rack and other Valves, Gas-Governors, Meters, Castings, Street-Lamp Fittings, Omedwor Gas-Stoves, Office Furniture, Gas-Testing Apparatus, Smith's Forges, 8-Ton Foundry Crane, Cupolas, 10-Horse Power Condensing Steam-Engine, Boilers, Lathes, Shafting and Workshop Machinery, 30 cwt. Weighing Machine, Jib Cranes, a 20-feet Gasholder in Cast-Iron Tank, with Purifiers, Station Meter, Condensers, and numerous other effects.

Sale to commence at Ten for Eleven o'clock prompt.

Catalogues may be obtained of Mr. E. BURDEN, Engineer, St. Neots, and of the AUCTIONEERS, St. Neots, HUNTS.

Price 10s. 6d., Green Cloth, Gilt Lettered,
VOL. LXXXVIII.
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WATER SUPPLY, &c.

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GAS, ELECTRICITY, & WATER WORKS FOR ASSESSMENT PURPOSES
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By THOMAS NEWBIGGING, M.Inst.C.E., and WILLIAM NEWBIGGING, Assoc.M.Inst.C.E.
WITH AN APPENDIX OF DECIDED CASES.

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HEATHCOTE GAS COAL.
Rich in Illuminating Power and yield of Gas. Above the Average in Weight and Quality of Coke.
Maintains a High Standard in Residuals.
THE GRASSMOOR CO., LD.,
CHESTERFIELD.

NEWBATTLE CANNEL.
Highest Results in Gas, & Excellent Coke.
QUOTATIONS ON APPLICATION TO
THE LOTHIAN COAL COMPANY,
LIMITED,
NEWBATTLE COLLIERIES,
DALKEITH, N.B.

Gas Companies are solicited to try Samples of the
MIRFIELD GAS COAL
UNEQUALLED.
Sperm Value 878·85 lbs. per Ton.
Prices and Analysis on application.
The MIRFIELD (GAS-COAL) COLLIERIES CO., RAVENSTHORPE, NEAR DEWSBURY.

RAILS.
New and Second-Hand with all Accessories; also Tip Waggons and Turntables.
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BRETTELL'S ESTATE LIMITED,
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Manufacturers of GAS-RETORTS, GLASSHOUSE FURNACE & BLAST-FURNACE BRICKS, LUMPS, TILES, and every description of FIRE-BRICKS.

Special Lumps, Tiles, and Bricks for Regenerative and Furnace Work.

SHIPMENTS PROMPTLY AND CAREFULLY EXECUTED.

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PRICE'S COKE & COAL BARROW

effects a great saving of time, labour, and expense.

For Particulars, Price, &c., apply to Mr. EDWARD PRICE, "Langley," Wyke Avenue, WORTHING.

THOMAS TURTON AND SONS, LIMITED,
SHEAF WORKS, SHEFFIELD,
MANUFACTURERS OF
FILES OF BEST QUALITY
FOR ENGINEERS.
STEEL OF ALL DESCRIPTIONS.
SCREW STOCKS, TAPS AND DIES, SPANNERS, RATCHET BRACES, LIFTING JACKS, ANVILS, VICES,
AND ENGINEERS' TOOLS GENERALLY.
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90, CANNON STREET, E.C.

ALEXANDER CAMERON,
GAS AND CANNEL COAL MERCHANT.
48, WEST REGENT STREET,
GLASGOW.

THE
"ROTARY" STATION METER.
Efficiency Demonstrated.
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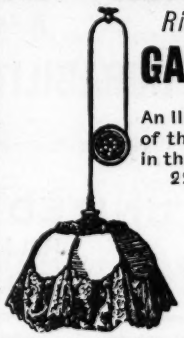
MANCHESTER.

THE "HANWELL" PATENT
Rising and Falling
GAS PENDANT.



An Illustrated Description of this Pendant appeared in the "Journal" for Nov. 22, 1904 (page 599).

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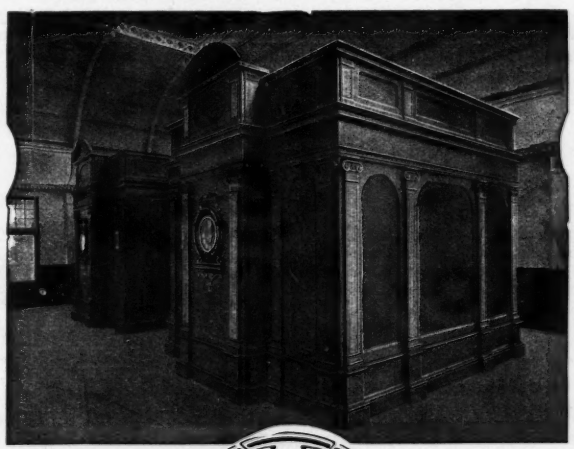

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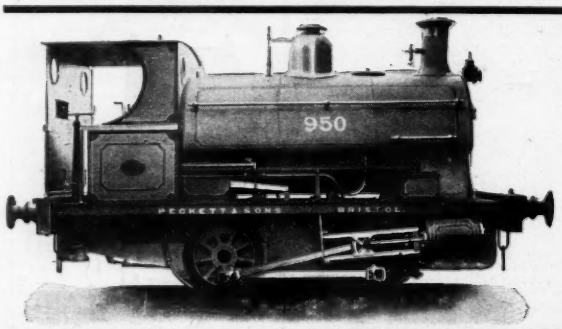

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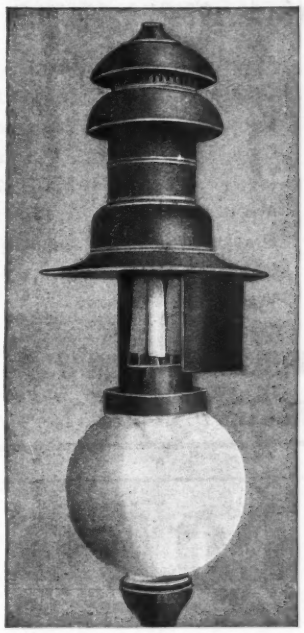
Globe lowered, showing wind-proof shield with door open for access to Mantles. Bottom cup can be removed for Globe cleaning.



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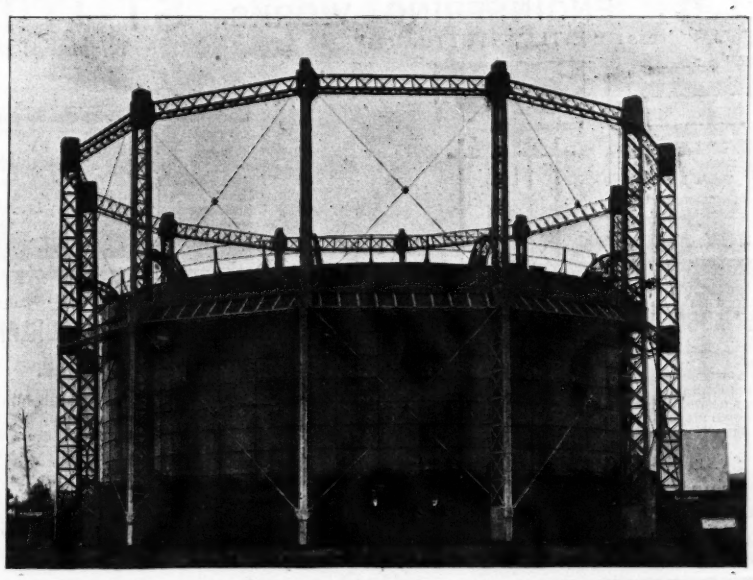

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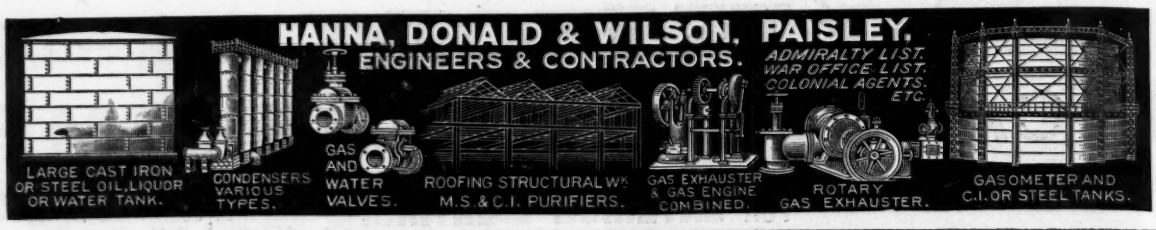
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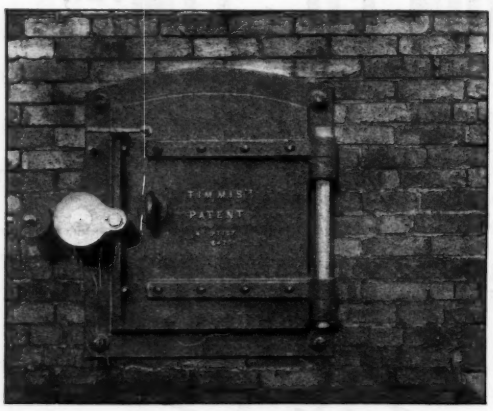
It is a well-known fact that the ordinary Clinkering Door which is fastened only at the middle almost invariably warps with the heat, thereby **admitting primary air in unknown quantities and in the wrong place.** Where two fastenings are used to either single or double doors it is impossible to apply equal pressure with them, and as a rule only one of them is used, the results being worse than with the single fastening. With Timmis's Patent it is impossible to avoid putting equal pressure on both top and bottom and with the same ease as with the old single fastening.



Advantages.

1. It renders **warping impossible.**
2. **No primary air** can pass into the furnace **between the Door and the Frame.**
3. It is **the only Clinkering Door** that can be **sealed top and bottom by the operation of one fastener.**
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6. It occupies **no more room than the ordinary door.**

DESCRIPTION OF DOOR.

TIMMIS'S PATENT CLINKERING DOOR is fastened by means of a vertical bar pivoted in the centre and provided with a screw at the top end. When the screw is tightened, the lower end of the bar is pressed with equal force against the lower corner of the door. **The two corners are therefore subject to equal pressure and warping is impossible.** To release the door the screw is loosened, and the bar, which is balanced by a counter-weight and rotates upon a strong pin attached to the frame, is moved clear of the door. The sketch above shows the position of the bar when the door is closed.

Further Particulars and Prices on Application to the Patentee:

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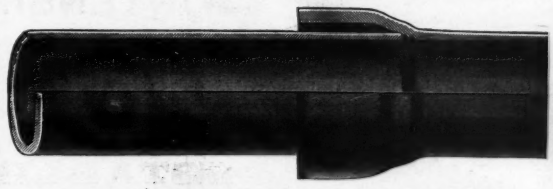

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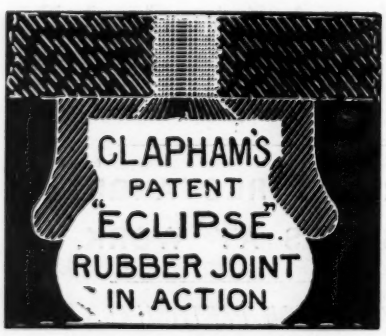

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